Railway Age

Vol. 64. April 5, 1918 No. 14

Loading Shells for a French 400-mm. Gun. Photo from International Film Service.

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EDWARD A. SIMMONS, *Pres.* L. B. SHERMAN, *Vice-Pres.* HENRY LEE, *Vice-Pres. & Treas.* M. H. WIUM, *Secretary.*

CHICAGO: Transportation Building. **CLEVELAND: Citizens Building.** **WASHINGTON: Home Life Building.**

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FIGHT
OR
BUY BONDS
THIRD
LIBERTY LOAN
Howard Chandler Christy 1917.

EDITORIAL

Railway Age

Announcement of the opening of the third Liberty Loan campaign will be found elsewhere in this issue. It is vitally important that the campaign be a striking success in order to encourage and back up our boys on the other side who are rushing into the thick of the fight. It is necessary also in order to discourage and wipe out the insidious German propaganda which is tirelessly at work throughout our nation. That the loan will be a success is assured by the businesslike and thorough way in which our people as a whole are planning for the campaign. One evidence of this may be found in our advertising pages. At a time when advertisers would naturally want to use their space for telling of the advantages of their equipment and devices, they have used this space fully and generously in order to advertise and push the loan. Let each one of us do our full duty in making the campaign a big success.

Third Liberty Loan Campaign

The present issue of the *Railway Age* is devoted largely to reviewing the developments in the railway and the railway supply field during the first three months of 1918, and is therefore called a "Quarterly Review Number." We have believed that developments are occurring so rapidly that it is worth while to make a survey of them at shorter intervals than has been our custom in the past. But the issue is not devoted entirely to review matter. Rather, it is devoted to an attempt to project the developments of the quarter of a year just closed into the future largely as a means of estimating where prevailing tendencies are carrying us. Both the officers of railways and those of railway supply companies have under present conditions more difficult problems to solve than they ever have had before. Full, frank, fearless discussion of these problems and presentation of the facts bearing upon them is essential to their proper solution; and the reader, whether railway or railway supply man, will, it is believed, find in the present issue many facts and much discussion which will be of interest and value to him.

The Quarterly Review Number

This week's issue of the *Railway Age* is in two sections. The first section is a quarterly review of affairs in the railway world; the second is a discussion of the effect which the political and economic events of the last few months have had on investment securities. While, of course, somewhat the large part of this discussion deals with railway securities, the broad field of corporation, municipal and national investment securities is included in the scope of the paper. The new section is devoted to the science of the utilization of wealth as capital. The distinction between wealth and capital is that capital is wealth used to produce more wealth. Idle wealth is not capital. There are a number of millions of people in the United States who made the first investment of their lives in one or other of the Liberty Loan offerings. It may well be that the motive leading to this investment on the part of a large number, even a majority of these subscribers was patriotism rather than a desire to save and to utilize their savings as an investment. Nevertheless, whatever the initial motive may have been, the fact is that these people are now investors; they have been given a taste, and a new appetite has been created.

The Investment Economist Section

While the war lasts, this appetite will be fed almost exclusively by the sale of government bonds. With the end of the war will come a cessation of government offerings, and the stimulus of patriotism as an incentive to investment will be withdrawn. It would be a national calamity, however, if the capacity for saving and investment created under war conditions was allowed to die out in peace times for lack of stimulation. The public's interest in saving and investment must be sustained. It will be the object of the Investment Economist section of the *Railway Age* to help arouse this public interest, to strengthen it and educate it while the war lasts, and to try to maintain it after the war ends.

Railroad Supply Industry and the Government

THE RAILROAD SUPPLY INDUSTRY is one of the largest industries in America. It has been built up to its present magnitude to make and furnish equipment, devices and supplies of all kinds to railways. It represents an investment of billions of dollars. The securities of the numerous companies composing it are held by people throughout the United States. It has large and small manufacturing plants scattered all over the country. It is estimated that it normally employs a million and a half men. So large and important an industry is entitled to demand and to receive fair treatment from the government. The public cannot afford to have the government treat it otherwise.

Reports from Washington are arousing great apprehension that the government does not intend to treat the railway supply industry fairly or intelligently, or to the best advantage of the government. The Railroad Administration has made the specifications of the locomotives and cars it is preparing to order wide enough open to give all the manufacturers of the various kinds of specialties with which they are to be equipped a chance to bid for business. That is a fair and sound policy. But, this having been done, the Railroad Administration's purchasing department called the makers of locomotive and car specialties to Washington this

week, and asked them, in bidding for business, to relinquish their patents, to forego their royalties on patented devices, and to lay before it all their cost accounts. The apparent purpose is to force the prices the government must pay down to the lowest possible basis.

Twelve years ago the government passed the Hepburn railroad rate regulation act, and began to pursue the policy of forcing railway rates down to the lowest basis it could without having the courts hold them confiscatory. Everybody knows the results. Railroad credit was destroyed; railroad expansion was stopped; in the midst of the greatest of all wars, transportation facilities have proved entirely inadequate to the country's needs; and because of the government's own stupid, restrictive, destructive policy it has had to take control of railroad operation and guarantee the financial return of the railways for the period of the war.

The railway supply industry has suffered greatly for ten years from the government's restrictive policy in dealing with its market, the railways. Does the government now intend to go still farther, and, by directly attacking the railway supply industry itself, complete the destruction of its prosperity? Is it so well pleased with the results of its regulation of railways that it considers it desirable to apply a like policy to a related industry? Does the public think the government's methods in regulating the railways have conferred such great benefits upon the nation that it will hail with satisfaction the prospect of the prescription of the same medicine for a very important part of the manufacturing industry?

What would the pooling of patents and the renunciation of royalties upon patented devices mean? The railway supply companies always have done business under conditions of intense competition. When, in a highly competitive field, a concern succeeds in developing and securing a substantial market for a patented device, that is an almost infallible sign that the device has merit in proportion, or more than in proportion, to the prices for which it has been sold. If a device has been worth to the railways what it has been sold to them for under private control, it must be worth an equal amount to them under government control. If so, how can the government, under government control of railways, fairly use its monopoly power to beat down the prices of railway supplies? To do so would be to deprive numerous companies of profits to which they are entitled by virtue of the enterprise and the ability which have been shown in their management. How does the government expect supply companies to forego their royalties? The various companies are under contract to pay the royalties to the inventors of the devices; and these contracts can not be abrogated without the consent of the inventors.

The officers of the railways of America deserve the highest praise for the receptiveness they have always shown to new devices the adoption of which would promote the technical development of the railroad machine. But the greater part of the work of originating and developing new and improved devices, whether parts of track, or signalling apparatus, or rolling stock, has been done by the railway supply concerns. They have taken commercial risks in carrying on this work; they have met with innumerable failures as well as successes; and every failure has meant loss of capital to them. Their only incentive in carrying on this work and taking these risks has been the prospect of profit. To the enterprise and initiative of railway owners and managers, and of railway supply company owners and managers, the American public owes the fact that today our railways are able to handle traffic cheaper, while paying higher wages than any other railways in the world. The partial withdrawal of the incentive of prospective profit has stopped the expansion of our railroads. The withdrawal of the same incentive from the railway supply business will speedily interfere with the technical development of our railroads. Unfair and arbitrary treatment of the supply companies by the government will also speedily affect adversely the welfare of every community in which their plants are located and that of all their employees, as well as of their stockholders. It will be economically harmful as well as morally wrong.

It is hard to believe that Director General McAdoo will finally carry out a policy such as now seems to be contemplated. Such a policy would be highly inconsistent with what he said to George A. Post, president of the Railway Business Association, as reported in the *Railway Age* of March 15, 1918, page 559. The railway supply interests should recognize the fact, however, that it is high time for them to strongly organize to protect their interests. They are engaged in an absolutely legitimate and extremely important business, a business whose efficiency and prosperity is just as important to the nation during the war as that of mining coal, or farming, or operating a railroad. They should go as far as the government can reasonably ask in co-operating with it and subordinating their interests to those of the public, but they should not surrender rights which other essential industries are not being asked to surrender, and the surrender of which might mean not merely temporary adversity for the supply industry, but a permanent loss to the industrial efficiency of the country. They should not, in a moment of panic, give up what the government cannot, without a gross and indefensible abuse of power, exact.

Will Aircraft Conditions Be Repeated on the Railroads?

THE NATION'S AIRCRAFT production program has come in for a great deal of notoriety during the last two weeks because of the disclosures in the Senate relative to the extravagant statements appearing in the captions of some photographs of aircraft production issued by the Committee of Public Information. It is apparent that the results so far obtained in the production of aircraft are exceedingly inadequate. After a year of nominal warfare the net result of all the planning and promises of enormous quantity production is practically nothing. Whatever contributing causes there may be to this situation, it is evident that the scheme of standardization which found expression in the so-called Liberty motor has failed to accomplish the result for which it was adopted, i. e., enormous and rapid production of effective aircraft. Indeed a suspicion is beginning to be voiced that not enough advice was sought from expert air men and too much from engine builders when the standardization scheme was formulated.

The director general of railroads has now had the task of supervising the operation of the railroads of the United States for three months. In that short space he has formulated a plan for an innovation in railroad practice which had never before even been seriously discussed by men in the business—the general standardization of locomotives. The director general, who is also secretary of the treasury and holds several other important offices, is a very capable but a very busy man. It is inconceivable that he can have given more than superficial consideration to some of the many matters of vast import of which he has the duty of final settlement.

The standardization of locomotives is a plan all of the advantages of which appear on a superficial inspection. Indeed, they are readily grasped by the public mind, just as was the standardization of aeroplane motors. But begin to study the whole bearing of such a plan, not on production of locomotives or first cost alone, but on the whole problem of railroad transportation, and the apparent advantages rapidly disappear. The locomotive is no more a machine complete in itself than is an aeroplane motor without the rest of the aeroplane. It is but one part of a vast and complicated instrument with all the other parts of which it must mesh if the whole is to function smoothly and produce the kind of results that ought to be produced now. And on every railroad the relation of all these parts is different. But apparently an attempt is to be made to force the same set of standard locomotives into all of these different machines and make the rest of the parts strain themselves into conforming shape.

It now appears possible that conditions similar to those apparently existing in the case of aircraft production may soon exist in the case of the railroads. One of the great needs of the railroads is locomotives; they need them immediately and they need all and more than they can get—not next year, but before next winter. With space soon to become available in the plants of the builders, the standard locomotive designs are not yet in final shape and today there have been no orders placed for material by the builders for use in building locomotives ordered this year. After all the details for the standard locomotives are finally settled there still remains a large amount of work to be done by the builders before production can begin; there are patterns, templates and formers to be made and castings to be secured, and there is a variety of material to be secured in a market already plentifully affected by priorities. Before production can be started, the builders are confronted with all the preliminary work required on a number of entirely new classes of locomotives equal to the number of standards finally settled upon. From now on every day of delay is piling up a loss of locomotive production which will soon overcome any possible advantage of production offered by the standardization plan. If orders for locomotives of designs already in service on the railroads in greatest need of additional power had been placed as soon as their requirements could have been canvassed, orders for material for much of the year's production might already have been placed and the builders assured of being able to take full advantage of every vacancy in shop space as it occurred.

The country needs this year locomotives to fit local conditions, rather than an enormous production next year of wholesale locomotives which will not be well adapted to conditions anywhere.

Three Months of Government Control

FOR A LITTLE OVER THREE MONTHS the government has been making the most interesting and important experiment with public control of railroads which any government in the world has ever made with public control of any large industry. The general lines along which government control is going to be developed now seem to be pretty clearly defined.

The Railroad Administration in January, the first month of its existence, had unprecedented difficulties to overcome. The railways, and especially the eastern railways, were terribly congested when it took control, and the movement of traffic had been showed down to a portentous degree by government priority and preference orders. There were the uncertainty and confusion unavoidably incidental to any change of such importance; and the weather was as bad as was ever known. In consequence, the railways during the first month of control failed to earn enough to pay their operating expenses and taxes. The eastern lines did not even earn their operating expenses. This is the first time this has occurred since the Interstate Commerce Commission began to compile monthly reports of railway earnings and expenses in July, 1907.

In the matter of weather, the Railroad Administration was as peculiarly favored in February and March as it was disfavored in January. Some of the confusion and uncertainty incidental to the adoption of government control had passed. One of the first acts of the Railroad Administration was to set aside all priority and preference orders; and it adopted vigorously the policy of embargoing traffic which it did not wish to move over certain railways or which it thought it could not move at all. In consequence, the congestion on the eastern lines has been greatly ameliorated. Meantime, however, the car shortage has increased.

The railroad control bill has become a law, establishing a reasonable basis for compensating the companies for the use of their properties.

The Railroad Administration has handled the problem of passenger train service very skilfully thus far. It has reduced passenger train mileage, and at the same time so rearranged schedules as to render it possible for people to travel in reasonable comfort.

The Railroad Administration has dealt fairly and skilfully with the railway labor problem. Its Railroad Wage Commission has not yet made its report but it is understood the result will be advances in the wages of both organized and non-organized employees proportionate rather to their needs and desserts than to the amount of force it may be thought the different classes could put behind their demands. Arrangements are also being made by the creation of permanent conciliation boards to settle all questions regarding wages and conditions of employment as they come up.

The Railroad Administration is adopting, or appears to be adopting some other policies of more dubious character.

In standardizing freight cars it has done good work from the railroad point of view, and at the same time has left the specifications wide enough open to give most supply concerns a chance to bid for business. Its plans for the standardization of locomotives are far more questionable. Freight cars do and must go everywhere and be operated under every variety of conditions. On the other hand, the greatest efficiency in locomotive operation cannot be obtained unless locomotives are designed and built to be operated under special conditions. A locomotive designed and built to be operated everywhere will hardly be a highly efficient machine anywhere. Furthermore, no new type of locomotive ever works well at first. The government, by attempting to standardize locomotives, is making a dangerous experiment.

At the same time it is asking railway supply companies to relinquish their patents and forego royalties on them. There does not seem to be any more reason why the railway supply companies should have such a request made upon them than why any other class of business concerns should be asked to destroy the foundation upon which their business is built.

The director general is creating a new and very highly centralized organization in an effort to bring about the unified operation of all the railways as a single system. He has appointed able and experienced railway men to most of the important posts in his organization. He is, however, carrying centralization so far that he is depriving many important railway officers of initiative, while loading down his regional officers and the members of his staff in Washington with an amount of work which can hardly fail to undermine their efficiency, if not break them down physically.

There is an evident tendency on the part of the director general entirely to sever the railway companies from the physical properties. In circular No. 16, issued on March 28, he orders that the presidents of the railroads shall in future be their operating executives under his direction, and that the chairmen of the boards and the directors shall exercise no functions connected with operation. In circular No. 17, issued on March 30, he directs that expenses incurred for corporate and financial purposes shall not be charged to operating expenses.

These orders raise some most interesting and important questions. Every railway does not have a chairman and also a president. Evidently on roads which do have both, the chairman of the board is to have nothing to say about operation, and is to get his salary, if he gets it at all, out of the company's guaranteed compensation. What about a road whose president performs both corporate and operating functions? Is he going finally to be required to choose whether he will devote himself exclusively to operating the property for the government, or exclusively to performing corporate functions for the company? If the chairmen are to have nothing to say about the operation of the roads, and if many presidents who have performed both corporate and operating functions are to cease to perform operating functions, it is evident that the government is going to lose the services of some of the ablest railway officers and that there is going to be a revolution of the railroad organizations far greater than was anticipated when President Wilson said to Congress, "Nothing will be altered or disturbed which it is not necessary to disturb."

Central News Photo Service

Testing the Mechanism of an Allied Gun

First Three Months of Government Control

Policies Being Developed by Railroad Administration for Welding the Railroads Into a Single System

THE RAILROADS OF THE UNITED STATES have now been operated under the possession and control of the government, and under the administration of William G. McAdoo, as director general of railroads, for three months. During that time many important developments have taken place in the process of unifying and co-ordinating the roads into a single system and while the time has probably been too short to warrant any judgment as to the results obtained, ample opportunity has been afforded by means of the various statements and orders of the director general, and the various measures he has already adopted, for a study in a general way of the policies which he is inaugurating and some of the objects he is seeking to attain.

On the other hand, while a great many things have already been done under government control which could not have been done before and considerable progress has already been made toward substituting a centralized organization for the separate management that formerly existed, it is to be understood that only a beginning has been made, and many and perhaps some of the most important developments of the new regime are still under consideration and have yet to manifest themselves. Mr. McAdoo has already gone far enough to demonstrate that he does not intend to confine himself to mere supervision and a policy of supporting the separate railroad managements with the authority of the government, but he is building up an organization to operate the roads as a single system. While the railroad control law is expressly declared to be emergency legislation enacted to meet conditions growing out of the war, it is evident that the breadth of construction to be placed on such a declaration depends to a considerable degree on the assumption as to the duration of the emergency, and the policies already adopted and put into effect by the railroad administration clearly contemplate much more than a temporary status.

At the outset, after accepting the resignation of the Railroads' War Board, Mr. McAdoo appointed a temporary organization, consisting of five railway officers as advisers and assistants to him, with A. H. Smith in particular charge of operation in eastern territory. Later he effected a permanent organization, which has been described in these columns as it has developed, consisting of directors of divisions of finance and purchases, transportation, traffic, capital expenditures, labor and public service and accounting, a general assistant and a general council, and each of these departments has built up its own organization. Where the war board, in its organization, had divided the country into seven districts Mr. McAdoo created three districts, each under a regional director, and the regional directors have established organizations of their own. Numerous special committees have been appointed to carry on special investigations. In addition a vast amount of information has been called for by means of numerous questionnaires that have been sent out, so that a great deal of detail has been centered in the offices of the railroad administration at Washington. How much of this centralization and detail is attributable to the desire for obtaining information necessary for the inauguration of new policies and to what extent centralization will be made permanent has not yet been indicated.

Separation of Corporate Officers

One of the results of the new regime that has already become evident is a separation between the corporate affairs of the railroads and their operations. Railway officers that have become members of Mr. McAdoo's organization have severed their connection with their railroads and by an order effective on April 1 the expenses of offices, including salaries, devoted to financial and corporate purposes as distinguished from operating affairs may no longer be paid out of operating revenues, but, to the extent that they are continued, will have to be defrayed by the corporations out of the amount paid to them as compensation by the government.

This is on the theory that the functions heretofore performed by such offices are now taken care of by the railroad administration, as far as their effect on operation is concerned, and that whatever else it is necessary for them to do is for the benefit of the corporation itself and not properly chargeable to operating expenses. This idea has been illustrated by the analogy of a landlord, who, having rented his property, naturally pays his own operating expenses from his rental income.

There have also been persistent reports, as yet entirely without confirmation, that the process of centralization will finally be developed much further, in the effort to reduce "overhead" and that the functions of many general and executive officers will be absorbed in a centralized organization.

After the decision had been reached to take over the railroads under the President's war power and the law of August 29, 1916, it was considered necessary to act at once, both because of the seriousness of the railroad situation existing at that time and because of the opportunity to make the change effective for accounting purposes with the opening of the new year. Although it is understood that the change was contemplated as early as the first part of November, the director general took charge of the railroads with little opportunity for preparation or for the formulation of policies in advance yet with a great many problems pressing for immediate solution.

Mr. McAdoo acted with characteristic promptness in dealing with the emergencies that existed, while perfecting an organization to carry out the purposes for which the roads were taken over. Orders were immediately issued to the railroads to disregard competitive conditions and to move freight by the shortest routes. Drastic reductions were made in passenger service. Demurrage rates were increased to a scale ranging from $3 to $10 and instructions were issued to embargo shippers who would not load and unload cars promptly. Embargoes were issued on some of the principal eastern lines against practically all freight except food, fuel and munitions, and to a considerable extent local embargoes were placed on other lines.

For the entire month of January unprecedentedly severe weather was experienced and for a time the activities of the railroad administration and the individual railroad managements were concentrated almost exclusively on keeping the railroads open sufficiently to handle the most essential business. With the improvement of weather conditions there has been an enormous improvement; the most pressing emergencies have been met and congestion on the eastern lines has been relieved to such an extent that operating conditions are now on an approximately normal basis. This improvement has given further opportunity for the development of more permanent policies and the past month has witnessed a considerable development of the permanent organization.

In a general way the objects which Mr. McAdoo has in

mind may perhaps be best explained by his statement before the Senate and House committees in January, during their consideration of the railroad control bill, regarding the reasons which impelled the administration to take over the railroads. Mr. McAdoo said:

Mr. McAdoo's Purpose

"The administration was confronted with the necessity of taking an extraordinary step to solve an extraordinary transportation problem. What I have already said has emphasized some of the controlling needs which could only be met by putting the power of the government back of railroad operations. The absolute co-ordination and, as far as necessary common use of all railroads and their rolling stock regardless of any private interests; the entire disregard of established routes for the movement of traffic when other routes would insure more or quicker service; the necessity for economy in the use of labor and material so as to do all that might be necessary for transportation with the least drain on the country's other demands for labor and material; the need for insuring the supply of capital necessary, notwithstanding the impaired credit of many railroads; the coordination of the government demands for priority in shipments—impossible under private railroad management; the absolute necessity for assuring railroad labor that its just demands would be met without necessity for strikes or threats of strikes. All these things and others which I shall not attempt to enumerate made it imperative that the government should, without delay, assume possession and control of the railroads as a war measure. It did this, and thereby brought into existence full governmental power to readjust methods of railroad operations and the currents of railroad traffic absolutely regardless of the interests of any particular railroad company or of any private or selfish interest.

"This extraordinary step being necessary, it was essential that it should be taken in a manner calculated to help rather than to hurt a financial situation of fundamental importance. Such action was calculated to cause the gravest disturbance to the whole financial structure of the country unless unquestioned assurance could be given by the government of an adequate protection to the holders of railroad securities, representing something like $16,000,000,000 in bonds and stocks. Even in time of peace the public interest would have made it highly important to avoid any such financial disturbance, but in the present war, when success cannot be achieved without the raising of unprecedented amounts of capital, it would have been unthinkable and self-destructive for the government in taking over the railroads to do so in such a way as to disturb rather than reassure the general financial situation."

Car Service

Common use of the rolling stock of the roads was attained to a considerable extent under the direction of the Railroads' War Board, and its subsidiary, the Commission on Car Service, which ordered cars from one road to another in accordance with the demands of traffic. Under government control this process has been carried further. The Commission on Car Service has been reorganized as the Car Service Section of the Transportation Division of the Railroad Administration and has charge of all matters pertaining to car service, including the re-location of freight cars as between individual railroads and regions. Its control over car distribution is more direct than it was before for the reason that there is no longer any incentive to consider the interests of individual roads, and the managements of the individual roads are no longer required to consider the effect on their earnings.

One of the first matters to which Mr. McAdoo directed his attention was the possibility of eliminating unnecessary ton miles by re-routing traffic on the principle that the railroads are being operated as a national system of transportation. Solicitation was discontinued and in his first general order he declared that all terminals, ports, locomotives, rolling stock and other facilities are to be fully utilized to carry out this purpose without regard to ownership; that the designation of routes by shippers is to be disregarded when speed and efficiency of transportation service may be thus promoted; that contract agreements between carriers must not be permitted to interfere with expeditious movements; and that through routes which have not heretofore been established are to be established and used whenever expedition and efficiency of traffic will thereby be promoted. The purpose has been to avoid as much as possible the use of circuitous routes by which a great deal of freight has been moved as the result of solicitation by individual carriers and at the request of shippers in order to obtain the benefit of differential rates. Railroad officers were requested to make every possible effort to move traffic by the most convenient and expeditious routes, and this policy has been carried out thus far mainly as directed by the regional directors and by the staff of the Railroad Administration as opportunity has presented itself in particular cases.

Re-Routing

However, committees have been appointed by the regional directors to make studies of the possibility of securing the most economical and efficient routing of freight in their territories and a general traffic investigating committee to study and make recommendations on the entire subject has been appointed by Mr. McAdoo, with B. L. Winchell, traffic director of the Union Pacific, as chairman, and George F. Randolph, commissioner for the lines in Official Classification territory, and T. C. Powell, vice-president of the Southern Railway, as the other members.

It is essential, to secure the best operating results, that traffic shall be sent over the shortest line between the point of origin and the point of destination, provided the short line is not overloaded. If the shortest line is congested, traffic should be routed over the shortest line that is open. The policy of the Railroad Administration is to bring about a distribution of traffic over all lines in proportion to their capacity. The difficulty of effecting a readjustment of the traffic currents has been greatly complicated by the fact that most of the lines in the eastern part of the United States have been carrying nearly their full capacity, and in many cases have been attempting to handle more freight than could be satisfactorily handled and there have been few lines sufficiently open to permit the diversion of a great deal of freight to them from other lines. The committees that have been working on this problem are still engaged in their investigations and have thus far only submitted tentative reports, although something has been accomplished by diverting traffic from circuitous routes into more direct channels.

Capital Expenditures

In order to effect economy in the use of labor and material in view of the demands for them for other purposes than transportation the director general, through the Division of Capital Expenditures, has undertaken a survey of the requirements of the roads in the way of improvements and extensions and the budgets submitted by the roads are being studied to the end that only the most essential work shall be undertaken. Without government control a railroad that was financially able to do so might have expended money, labor and materials on a project fully warranted from its own standpoint but which, from the standpoint of military necessity or of the public interest in general, might better have been used on some other road. Under the policy adopted the Railroad Administration will have the decision as to where the expenditures shall be made.

The policy of the Railroad Administration as to capital

improvements has been outlined in General Order No. 12 issued on March 21. In determining what additions and betterments, including equipment and road extensions, should be treated as necessary, the following principles are to be followed: From the financial standpoint it is highly important to avoid the necessity for raising any new capital which is not absolutely necessary for the protection and development of the required transportation facilities to meet the present and prospective needs of the country's business under war conditions. It is likewise highly important that the available supply of labor and material shall not be absorbed except for the most necessary purposes.

Railroads are also asked to bear in mind that projects which might be regarded as highly meritorious and necessary when viewed from the separate standpoint of a particular company may not be equally meritorious or necessary under existing conditions, when the facilities heretofore subject to the exclusive control of the separate companies are available for common use whenever such common use would promote the movement of traffic.

Robert S. Lovett, formerly chairman of the executive committee of the Union Pacific, has been appointed Director of the Division of Capital Expenditures and has organized a staff of assistants. To him have been referred budgets prepared by the individual railroad companies outlining their ideas as to necessary expenditures for the year. For the eastern district a sub-committee of engineers has been appointed to go over these estimates for the purpose of making recommendations.

General Order No. 12 also provided that the construction of new lines or branches or extensions of existing lines shall not be entered upon or contracted for and that no new locomotives or cars shall be ordered or contracted for without the approval of the director general. Work contracted for or actually commenced prior to January 1, 1918, and unfinished may be continued until further order except in so far as in the judgment of the carrier it may be possible to discontinue or curtail it without substantial loss. Work involving a charge to capital account in excess of $25,000 shall not be contracted for or commenced unless it conforms to the general policy as to necessity, and unless it has been authorized by the director general. Other work which does not involve charges to capital account in excess of $25,000 may be contracted for and commenced without approval, provided it conforms to the general policy as to necessity and also falls clearly within the policy of the particular carrier as that policy has been applied in practice during 1916 and 1917. However, a report regarding work involving between $5,000 and $25,000 is to be made in duplicate to the director of the division of capital expenditures and to the regional director.

Where minor capital expenditures are needed to establish new connections for the better use of terminals the regional directors have been authorized to endeavor to get some or all of the interested companies to arrange therefor by voluntary action and to refer to him cases of expenditures which cannot be so arranged.

As an example of the policy of the Railroad Administration, the work of track elevation at Indianapolis, which was half completed, was held up until the director general had assigned Interstate Commerce Commissioner Harlan to make a report on it. On the commission's recommendation an order was issued permitting the work to be completed in a modified form. Also the city council of Chicago, which was prepared to recommend track elevation work at Chicago to cost about $5,000,000, has been requested by the director general to defer further consideration of the work until the conclusion of the war.

Regarding passenger service the policy of the administration is to curtail the number of trains to the minimum necessary to afford ample accommodations for necessary travel while discouraging unnecessary travel. In England passenger fares were increased 50 per cent to discourage travel. It is understood that Mr. McAdoo felt that a policy of increasing fares would have little effect in this country in discouraging unnecessary travel while in some cases it would impose a hardship on persons obliged to travel and that a more effective plan would be to reduce the service to a degree approaching discomfort. The purpose of reducing passenger service is to conserve the use of fuel, labor, locomotives and shop capacity for freight service but Mr. McAdoo has insisted that due consideration shall be given to the public convenience and, for the purpose of avoiding the local antagonism which might arise if such matters were decided by the railroad managements, he has ordered that questions of train service and similar matters be referred to him for decision. His idea is that policies which substantially affect the character of the service rendered the public or the rights of the public will be more readily accepted if he, as the direct representative of the government, has the deciding voice, than if they are decided upon by railroad men themselves.

Passenger Service

Mr. McAdoo expects that a considerable reduction of train service may be effected without any reduction of the available accommodations for the public by eliminating duplications of service resulting from competition. A rearrangement of the Chicago-St. Louis passenger service was put into effect, reducing the number of trains from 15 to 9 while giving the public approximately the same number of times in the day when trains are available. Studies have also been made of the possibility of similar rearrangement of service between other large cities where the various competing roads have maintained competitive schedules.

Another policy regarding passenger service has already been put into effect by the consolidation of city ticket offices at Washington, D. C., and Atlanta, Ga., thereby effecting a considerable saving in rentals while affording the advantages of a centralized location; and studies are being made of the possibility of making similar changes in other cities.

Priority in Transportation

Co-ordination of the government's demands for priority in transportation which had so much to do with causing the congestion on the eastern roads during the latter part of 1917, was one of the first problems with which the Railroad Administration was called upon to deal. As a first step all priority orders were abolished and a plan was worked out by the Traffic Division by which experienced traffic officers have been placed in the War and Navy departments, the Shipping Board and the Food and Fuel Administrations, reporting to the Traffic Division, for the purpose of co-ordinating the traffic needs of these various departments. A new plan of ordering preferential shipments on government account has also been put into effect, superseding the old "blue tag" system.

Wages and Labor

The policy of the administration regarding wages was made evident within a very short time after the government had taken over the railroads. At that time the brotherhoods representing the firemen and hostlers, the conductors and the trainmen, had pending demands for a considerable increase in wages which had been formally declined by the railroads, who had placed the entire question in the hands of President Wilson. Other classes of employees also had various demands pending and the railroads had made numerous settlements during the year which had to some extent increased the wages of the lower paid classes of employees. However, the cost of living had been steadily increasing and the railroads were having great difficulty in retaining ex-

perienced men in their service in competition with the munitions plants and other industries. Mr. McAdoo, therefore, let it be known that the government intended to increase wages to a point which would represent recognition of the higher cost of necessities and bring about a greater degree of contentment on the part of railway employees, and he appointed a Railroad Wage Commission to investigate the entire subject of railway wages and make a report to him for his action.

In order to obtain the benefit of the effect on the spirit of the employees at a time when most of them were being called upon for special exertion it was promised that any increases awarded would be effective as of January 1. The wage commission held public hearings at which representatives of all classes of employees were given an opportunity to present their requests but the investigation has not been conducted as an arbitration proceeding and boards of statisticians and examiners were appointed to aid the commission in a determination, from a study of the available facts and statistics, of what would be a fair adjustment of wages. The commission has now practically completed its work and will shortly render to Mr. McAdoo a report recommending general increases which will aggregate several hundred million dollars. Pending action on the report of the commission, Mr. McAdoo has told the railroads that there ought to be no radical change in existing practices without submitting the matter to him for approval, and that no interruption of work should be allowed because of any controversies between employers and employees.

Mr. McAdoo has adopted a conciliatory policy toward labor and is apparently endeavoring to iron out some of the causes for friction between the officers and employees. He has appointed a labor representative, W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, as a member of his staff to give special attention to labor problems, and permanent wage boards will be organized to adjust questions affecting labor which may arise after the wage commission has rendered its report. Mr. McAdoo has had frequent conferences with representatives of labor organizations and recently reached an agreement with the officers of the railway employees' department of the American Federation of Labor regarding working conditions in the mechanical department for the purpose of meeting the emergency as to locomotive repairs.

Financial Assistance

The first step toward rendering financial assistance to a railroad was taken on March 27 when the director general, after many conferences, agreed to advance $43,964,000 to the New York, New Haven & Hartford to protect its maturing note issue. While it is expected that most roads will be able to take care of such requirements it is the intention to give such assistance as may be necessary, either by the purchase of securities by the government, or from the revolving fund consisting of the $500,000,000 appropriation and any surplus earnings above the guaranteed compensation, which fund is also to be available for expenditures for improvements. It is also contemplated that advances may be made under the terms of the War Finance Corporation bill.

Purchases

As far as purchases of materials, supplies and equipment for the railroads are concerned, the policy of the administration contemplates a considerable degree of centralized supervision but, for the present at least, by no means complete centralization. All purchases of locomotives, cars and rails are to be made directly through the office of the director of purchases and he will be assisted by an advisory committee of three experienced railroad purchasing agents, who will formulate plans for the co-ordination and supervision of railroad purchases. There are also three regional purchasing committees which are to give consideration to the opportunities for standardizing and consolidating purchases of every kind that may admit of such treatment, with a view to increasing efficiency and economy.

Most supplies needed for current operations will be purchased, at least for the time being, through the purchasing departments of the respective roads, but all contracts for periods of six months or longer must be approved by the regional committees before completion. Information as to prices paid will be furnished monthly by all roads to the regional committees so that they may be compared and checked and full statistics as to prices will be exchanged between the regional committees and the central committee for comparison and checking. This will naturally tend to promote standardization.

Standardization

Mr. McAdoo believes that he has inaugurated an important reform by the adoption of standard designs for cars and locomotives, which will reduce their first cost and also make it possible to build them more quickly. Very early in his administration he called on committees of car and locomotive builders to submit standard designs and these were later referred to a committee of mechanical officers, appointed by the regional directors, with H. T. Bentley, mechanical assistant in the transportation division as chairman. After revisions suggested by the railroad committee the designs and specifications were approved by the regional directors and by the director general, after which they were turned over to the builders and bids were asked on March 25. It is understood that 100,000 freight cars will be ordered. The locomotive designs are also practically approved and a conference between the central advisory purchasing committee and manufacturers of specialties was held at Washington on Monday of this week.

Considerable apprehension had been aroused among both railroad men and the supply interests during the progress of the work on the standard designs lest the standards adopted should be so rigid as to exclude many patented devices and tend to discourage improvement; but when the car specifications were finally issued they were found to be along broad and rational lines. It is understood that the locomotive designs are equally liberal.

It is also expected that purchases of railway supplies and materials under government control will show a considerable increase over those of recent years, and Mr. McAdoo has indicated that his policy will be to keep the door open for giving full and fair trial to new and improved devices.

Railway Organizations

In General Order No. 6, issued on January 28, the director general ordered that railway operating revenues should not be expended for the payment of persons or agencies constituting associations of carriers unless such association is approved in advance by the director general.

This at once raised a question as to the status of a host of railroad committees and organizations of various kinds, such as the American Railway Association and the various operating associations that report to it, the traffic associations and such organizations as the Railway Mail Pay Committee, the Railway Executives' Advisory Committee and the Bureau of Railway Economics. Many of these bodies applied to the director general for approval, giving a description of their purposes and functions and the amount of their expenses; and the subject was turned over to C. A. Prouty, director of public service and accounting, for investigation. Pending a decision the various organizations were given letters authorizing them to continue until April 30, after which it is expected that some of them will be told that if they are to be continued they will have to be sup-

ported out of corporate funds rather than from operating revenues, while others will be continued and others will be consolidated.

The general policy is that only those associations whose work is considered necessary to the operation of the railways as a system may continue to have their expenses charged to operating expenses. Order No. 6 also provided that operating revenues shall not be expended for the payment of agents or other persons employed in any way to affect legislation, for the employment of attorneys not actually engaged in the performance of necessary legal work, or for political purposes or to influence any election. In accordance with this order the office of the general counsel of the Railroad Administration has been holding conferences with the representatives of the legal departments of various companies arranging for a readjustment and a considerable reduction of expenses in the legal department. A considerable number of lawyers, whose chief function has been to represent the companies before legislatures and Congress, will be dropped from the payroll.

Rates

One of the principal sources of difference encountered during the consideration of the railroad control bill in Congress was the question as to the power of the President, or rather of the director general acting for him, to make rates.

Mr. McAdoo took the position before the bill was passed that the President undoubtedly had the power to control rates during the time of federal possession, on the theory that the Interstate Commerce Commission had no power to regulate the President in the exercise of his war powers; and that he ought to have the power, but that it ought not to be exercised except in such cases as may be necessary in the public interest. There was much opposition to any curtailment of the powers of the Interstate Commerce Commission and, as the law was finally passed, it authorized the President to initiate rates and to put them into effect, subject to the final authority of the commission, which was required to take into consideration the circumstance of federal control and a certification of the President that higher rates were necessary.

Even this compromise has not entirely satisfied the shippers, because rates initiated by the administration may go into effect at once without a hearing or a suspension and they have been considerably concerned, according to reports, for fear that arbitrary action will be taken. Mr. McAdoo indicated, however, in his testimony before the Congressional committees, his opinion that it would be very unwise for him to undertake to pass upon rate questions except in a general way and that the judgment of the Interstate Commerce Commission ought to prevail except in so far as it might be wise for the President to modify it. It is generally expected that he will consider it necessary to ask for a general increase in rates to meet increased expenses, particularly after the wages are increased, and that he thought the President ought to have full power to make such increases if he considered it necessary, without interference, but that he has no desire to interfere in ordinary rate cases. Speaking before the Senate Committee, Mr. McAdoo said the President ought to have the power, but that the commission ought to hear the cases just as before and that when they have reached a conclusion it ought to be in the form of a recommendation to the President.

During the period before the law was passed, Mr. McAdoo wished to inaugurate several measures requiring tariff changes, and he did so by following the course pursued by the railroads of requesting the commission's permission, which was in every case promptly granted. Since the law was passed the railroads have followed their usual practice of filing fifteenth section applications for permission to file tariffs of increased rates and the Railroad Administration has not yet attempted to initiate a rate. The committee on Uniform Classification has been directed to submit an early report, but it has already been announced that hearing will be held by the Interstate Commerce Commission before any action is taken.

Some of the things that have been accomplished under government control which have been more or less agitated in the past but have not been put into effect because of failure to agree or lack of a central authority to put them into effect, have been the higher demurrage rates, which railroads have been agitating for years; a universal interline waybill, which the accounting officers have been urging for many years and which the Railroads' War Board strongly recommended last fall, and uniform rules for packing and marking freight. Railroads at various times have also made unsuccessful efforts toward a curtailment of competitive passenger service such as has been put into effect between Chicago and St. Louis. They have been somewhat more successful in efforts to secure greater economy by joint or centralized ticket offices, but a much greater impetus to this movement has been given by government control.

The standardization of freight cars represents another field in which the Railroad Administration has been able to accomplish in a short time something that railroad men have been working toward for a long time.

Prospects for the Future

The railroads had no more than passed under government control when eager discussion began as to whether they would ever be returned to their owners or to their former status, and the discussion then aroused has continued. Both in the way of criticism and with approval interested men have commented on each succeeding development of the director general's policies with remarks that they did not bear the earmarks of temporary policies. But Mr. McAdoo has not dodged the issue. He has frankly stated the opinion that it is going to be impossible ever to restore precisely the status of the railroads that existed before December 28, 1917.

In explaining his reasons for opposing a definite time limit in the railroad control bill before the House Committee in January, he said: "I believe that a very much larger measure of strong, effective, intelligent government regulation and control of these properties is going to be inevitable in the future, and I favor such control. If it turns out that public operation of railroads in the United States is beneficial to the common interest, to the public interest, I think the people are going to demand that government control be retained upon some terms which Congress must determine at the time and in the light of experience then existing."

During his testimony before the Senate Committee, Mr. McAdoo was asked whether he personally believed in government ownership of railroads.

"I do not," he replied, "or I have not, at least, felt that it was necessary to take the actual ownership of the railroads. I believe that it will be impossible after the return of peace to restore the competitive conditions to the same extent as they existed prior to the outbreak of the war.

"I favor some form of governmental regulation and control of a far stronger, more intelligent and effective character than we have had heretofore, because I am satisfied that a stronger government control will be demanded and will have to be worked out, both in the interest of the public and in the interest of the security-holders of these railroads."

While the President said in his message to Congress on January 4, that "nothing will be disturbed or altered which it is not necessary to disturb," Mr. McAdoo made it evident in his testimony on January 23 that he interpreted that languge rather broadly. "From the public standpoint it is

necessary," he said, "that government possession and control of railroads shall be employed to remove for the time being competitive practices and wasteful duplication of effort to the end that every energy shall be mobilized upon the production of the greatest amount of transportation with the least expenditure of labor, material and money.

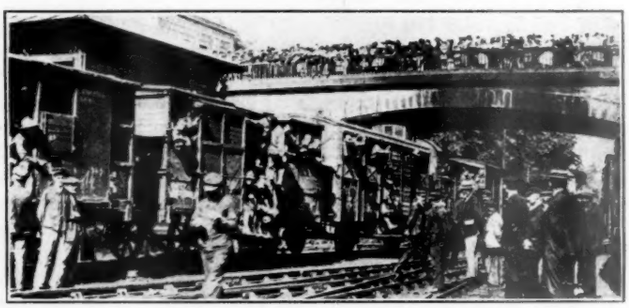
"The result of this process of unification will be that when the war ends the railroads will be, to a large extent, disabled for the immediate resumption of their old competitive status. Shippers and the public generally will be accustomed to new methods of doing business with the railroads. They will find that the old methods under which they have been routing freight and have been doing business will be substantially and perhaps permanently altered."

All this indicates very clearly that Mr. McAdoo is not going to be deterred from putting into effect some policy which he believes will result in an improvement, merely because of any idea that his control of the roads is to be temporary. He interprets the word "temporary" to contemplate a period of time long enough to enable him to manage the railroads as he thinks they ought to be managed; he has confidence in his ability to produce successful results and he hopes that the policies he is putting into effect will be so successful that everybody will want them continued whether or not the period of government control is prolonged beyond the period contemplated in the law.

Perhaps this may be stated by saying that Mr. McAdoo is proceeding on the only safe assumption, that the war is likely to last for a long time. At any rate he has already gone far enough and said enough to give a strong impression that he is not worrying about a time when the government will no longer be in control. He is in control now and he is directly concerned now with the prosent problem of winning the war and of so increasing the efficiency of the railroads as to contribute to that result. Possibly he is doing some things that he would not consider necessary if he expected the war to be over in six months, because he does not expect that; and he is trying to do the things which he believes will produce the greatest efficiency in transportation and with the greatest possible economy consistent with that result.

He hopes to be able to effect considerable economies in railroad operation, but he also knows that many factors enter into the situation which are likely to increase expenses, and he considers economy secondary to efficiency. For example, he knows that the report of the Railroad Wage Commission will result in a great increase in expenses by advancing wages, but he considers that higher wages are necessary to promote a better feeling on the part of the employees; are necessary not only to offset in part the increased cost of living, but that they will tend to improve efficiency. Testifying before the House Committee, he said:

"It may be possible, through economies that can be practiced under combined and co-ordinated operation of the railroads of the country, to overcome any advances that may have to be made in wages and in the extra cost of material and supplies, due to the very high prices prevailing throughout the country. Certainly every effort will be made, consistent with good management and with the public interest, to make the roads earn a surplus. Naturally we want to do that, but I have not felt that we ought to rely too much upon that possibility. If that is the situation it will be developed. If it does not develop, we must be prepared to act without reference to it."



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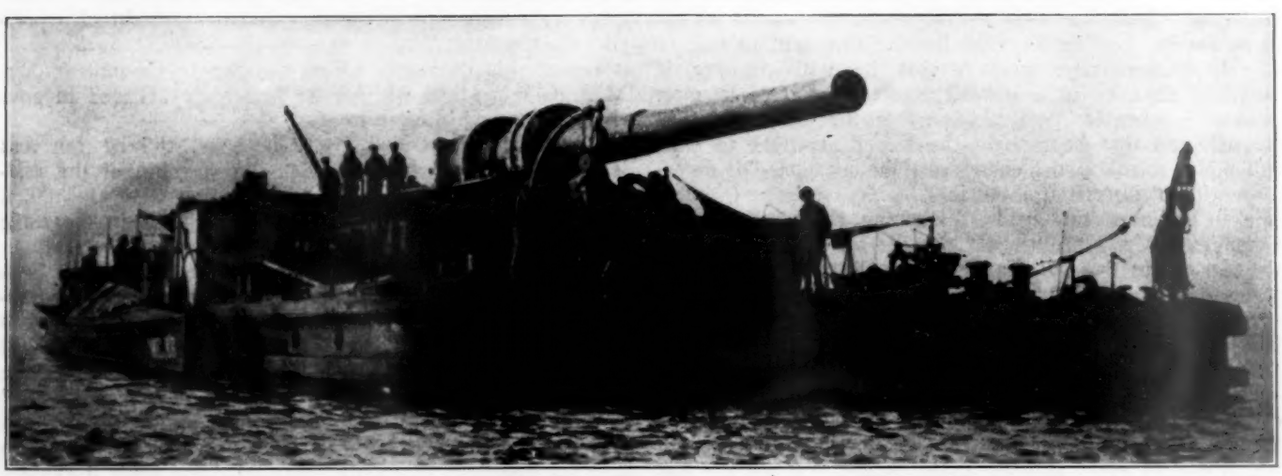
Our Men Travel in Freight Trains Over There, but the Enthusiastic Welcome Makes Up for It



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The Italians Are Now Mounting Heavy Guns on Barges as Well as Railway Trucks. This Gun Is in Use on the Lower Piave

What Government Ownership Would Mean*

Effect on Other Businesses and Persons of Establishing a Gigantic Monopoly, Shall We Prussianize?

By Samuel O. Dunn

I RECOGNIZE that all of us ought, while this war lasts, in all our thoughts and acts, to subordinate every other object to the winning of the war. If we do not win, it will make little difference what we think or desire regarding government ownership of railways or any other economic or political question.

But we are not going to lose. Nor are we going to accept a draw. We are going to win so decisively that we shall look back with astonishment to the time when we had our doubts and apprehensions.

In all the affairs of human life there are imponderable as well as ponderable, moral as well as physical, values; and in the long run they are the decisive things. You can't throw the opinion of mankind into a scale and weigh it as you can Hindenburg's sword, but in the long run men's opinion proves weightier than any man's sword. Germany, by the things she is seeking and the methods she is using, has convinced a great majority of mankind that her victory would destroy the liberties and stop the moral and political progress of the human race. Therefore the more victories she wins the more she arouses the fears and opposition of the rest of the world, and the more certain she makes it that she will finally go down in disaster. You remember what Napoleon said of the English. Somebody remarked that they lost many battles. Napoleon replied that was true, but that in every war they always won the last battle. Democracies such as ours and those of England and France, when pitted against a military autocracy such as that of Prussia, are likely to lose the early battles, but it is the last battle which decides, and no man who understands the spirit of the world, and especially that of Italy, France, England and America, doubts on what country's soil the last struggle of this war will be fought, or what nation it will bring to its knees.

When we have won, as win we shall, we shall have the opportunity and duty, in fact be under the necessity, of solving rapidly a number of great problems, and foremost among these will be our railroad problem. We are making a most interesting experiment with government control of railways during the war; we must settle the railroad question soon after it is ended; and, therefore, while we are devoting ourselves primarily to winning the war, we ought to give all the study, all the discussion, to the railway question that we can. "In time of peace prepare for war," said Washington. He might have added, "In time of war prepare for peace." This is especially good advice now, for it is plain to every observing and far-seeing man that the conditions, national and international, which will exist after the war will subject our economic and political institutions to strains different from, but hardly less severe than, those to which they are being subjected by the war. We shall have problems created by the economic and political conflicts of class with class, of section with section, of nation with nation. We shall have problems regarding the production of wealth, regarding its division between capital and labor; problems regarding the assimilation of soldiers into civil life, and of domestic and foreign trade—in brief, problems of peace unprecedented in their number, their complexity and their magnitude. It is so important that we should be studying and thinking about the railway question now because on the way it is settled will largely depend the success we shall meet in solving all our other problems of peace.

Government and Business After the War

Never since the destruction of the ancient regime in France by the Great Revolution have the governments of civilized countries taken such extensive control of business as in this war. Is government intervention in business to continue after the war on anything approaching the present scale? If so, is it going to take the form of ownership and operation of large industries, or of restrictive control of them, or will it take the form of strict control for the protection of the public, supplemented by helpful co-operation in solving business problems?

I believe it is desirable during the war to operate our railways under a single direction, and that to protect investors while this is being done it is necessary to guarantee the financial return of the companies. I do not believe it was necessary or desirable for the government to assume the complete control of operation it has. Now that this has been done, however, it is the duty of every citizen, whether an officer or employee of the railways, or a user of their service, or, like myself, a humble commentator on their affairs, to do all possible to make government control a success.

Last winter, soon after government control was adopted, and the railways were struggling with the largest and most complex traffic, and the most adverse weather conditions ever known, the charge was made and widely circulated that railway officers were "lying down" to discredit government control. I know many of the railway officers of this country, high and low, and I know their attitude and spirit as well as any man living, and the most fitting comment I can make on that charge is that, in the language of Shakespeare, "It is an odious, damned lie; upon my soul, a wicked lie." There may be railway officers and employees who are so selfish or disloyal that they want to see government control fail; but with negligible exceptions they desire, for patriotic reasons, to see it, and are working to make it, a success.

Some people contend that if government control is a success it will afford a conclusive argument for government ownership. It is impossible to accept that view. The results of operation of the railways under government control in war should be better than the results of government operation probably could be in peace. The officers and employees are inspired by more patriotic zeal than they would be in peace, and the Railroad Administration probably will not be subjected to the political and other vitiating influences that it would be in peace. Therefore, the results of government control cannot afford a basis for a rational argument for government ownership.

Effect of Government Ownership on Other Industries

If government ownership of railways should be adopted, the railways would not be the only class of concerns directly and indirectly affected. No argument can be made for government ownership of them which cannot be made with equal force for government ownership of telegraphs, telephones, local public utilities, coal mines, lake and ocean shipping, and many other lines of industry. If, by adopting government ownership of railways, we break down the dam which

*An address delivered before the Buffalo Club, Buffalo, N. Y., on March 30.

holds back the rising tide of radicalism, the country will be fortunate if it is not speedily overwhelmed with a flood of socialistic measures which will revolutionize our economic and industrial system. The railways constitute in value one-twelfth of all the property in this country. If the public could be convinced they should be taken over, what argument could be effectively made against government acquisition of other large classes of property whose purchase and management would present problems much less complex and difficult?

Even though state socialism should be carried only as far as the ownership and management of the railways, the effects would be felt by every kind of business concern and every class of our people. The railways are the largest consumers of coal, of lumber and of iron and steel. They are among the largest advertisers in the newspapers and magazines. Since government control was adopted, many of those who produce and sell to the railways have become aroused to the fact that that control has given the government a power almost of life and death over their businesses. When a large number of concerns are buying things, and a large number are selling them, there is competition on both sides. When one concern is doing all the buying and many are competing in selling, all the advantages in the negotiations are on one side. The situation which has developed under government control has caused great anxiety among concerns having billions of invested capital and hundreds of thousands of employees which have been established and built up to produce and sell goods to railways. They have become aware that a permanent government monopoly of railroads would have a meaning and an effect for them which had never entered the minds of most of them before.

A Gigantic Government Monopoly?

On the other side are the patrons of the railways, the traveling and the shipping public. Under government ownership they also would have to do business with a single gigantic railroad monopoly. Now, most of us believe that there has been too much of certain kinds of competition between railways, and that it has resulted in wastes and other evils. Many, in fact, believe that the system of railroad regulation and management which prevailed before the war was extremely deficient, and that if the railways are to be returned to the operation of private companies both our system of ownership and our system of regulation should be changed. But there are few who, as patrons of the roads, can contemplate with equanimity the prospect of their being welded permanently into a single great monopoly owned and managed by the government.

What effective means of protecting their rights and legitimate interests would those who sell goods to the railways and those who buy transportation from them have if this great monopoly were disposed to abuse its power? None, except that of resorting to political action of some kind. What means would railway employees have of protecting themselves if this great monopoly should be disposed to abuse its power? None, apparently, except strikes or political action of some kind.

Looking at the matter from the standpoint of the public as a whole, it is evident that the main thing it wants from railways is transportation service adequate to move the available traffic satisfactorily and to develop the resources of the country. The nation has suffered recently from inadequate service; and the losses it has incurred as a result have exceeded what a higher scale of freight rates would have cost it over a long period of years.

No system of railways can be said to be a success which does not maintain a fair and reasonable relationship between the rates it charges and the service it renders to its patrons, the wages it pays to its employees and the return which it earns for its owners. This is true whether the railways are owned by private companies or by a government.

Now, what one thing is absolutely essential to enable a railway system to render good and adequate service, to make reasonable rates, to pay reasonable wages and to earn a fair return? The answer, of course, is far-sighted, enterprising and efficient management. But it is contended government ownership would possess some advantages which private ownership cannot have. The government, it has been argued, could raise at 3 per cent all the capital required to buy the railways and increase their facilities. Facts recently have exploded this theory. The government since we entered the war has not raised one-fourth as much capital as would be required to buy the railways, but already it is preparing to float a large loan at 4¼ per cent, and it would have to pay more if the people were not impelled by patriotism to make it loans at an artificially low rate. There is not, as some seem to think, an unlimited supply of 3 per cent, or even 4 per cent, capital. Most capital in this country prefers investment in speculative enterprises offering a chance of large returns to investments offering a certain but low return.

Good Management Absolutely Essential

It is questionable whether even before the war our government could have raised enough caital to buy the railways for less than 4½ per cent. On this basis the saving made by substituting the government's credit for that of private companies would have been small. Furthermore, for some years the prevailing rate of interest probably will be high, and for the government to acquire the railways soon after the war would be to saddle itself with inflated fixed charges for many years to come.

Again, it is said the government could operate the railways as a single system and avoid the wastes incidental to competition. But it is extremely doubtful if centralized management of the railways as a single huge monopoly in time of peace would have any advantages. Our railway system includes 260,000 miles of line. This is five times more mileage than there is in any other country. It is one-third the mileage of the entire globe. Perhaps the present system of centralized control will point the way, but the problem of organizing and managing such an immense mileage operating over such a vast area as a single unit so as to get good results seems almost insoluble. Even under government ownership it probably would be necessary, in order to get the best results, to divide this system into several parts and operate them almost independently. If you should divide our railways into ten units of equal mileage, each unit would have more mileage than the railways of France, or those of Great Britain and Ireland, or those of Prussia. If you should divide them into five units of equal mileage each unit would have more mileage than the railways of any entire country except the United States. Even under the most skillful and energetic management possible all the benefits gained by complete consolidation of our railways probably would be more than nullified by disadvantages inevitably arising from the unwieldy magnitude of the undertaking.

Furthermore, whatever rate might be paid for capital, and whatever might be the advantages of consolidation, there is no adequate substitute, in the railroad or any other business, for far-seeing, enterprising and efficient management. A weak and short-sighted management will always fail to profit by its advantages, and at the same time will fail to increase economy and efficiency in many directions in which a strong management would increase them. After all, therefore, the vital question is whether private management, if given a fair chance by government regulation, probably would be more or less far-seeing, enterprising and efficient than government management. If private management, if given a fair chance by regulation, would be the more efficient, the American public's duty to itself is to preserve private management and cause government regulation to give it a fair chance.

Recent experience has demonstrated that the transportation

facilities of this country have become inadequate. They are insufficient satisfactorily to move the available traffic, especially in eastern territory, despite the fact that in eastern territory the capacity of the railways in proportion to area and population is larger than anywhere else in the world. There have been no such congestions in the south and west as in the east; but even in those territories there is need of much additional mileage to enable them to support a larger population and to develop their natural resources. Both the intensive and the extensive development of the railways has greatly declined. A few years ago the average annual investment in them was about $750,000,000. Before the war began it had declined to $310,000,000. In 1916 it was only $280,000,000. This decline of railway investment is the main cause of our present transportation plight.

Would Government Management Be Efficient?

The public must consider whether the expansion of our railway facilities is more likely to be adequate, and to be secured with reasonable economy, under private or under government management. There are certain incontrovertible facts which bear upon this question. One is that until the present restrictive policy of regulation was adopted the facilities of our railways were relatively greater, and were being increased faster, than those of any other railways in the world. Prior to the war our railways had almost six times as much freight carrying capacity in proportion to our population as those of Germany; and the railways of Germany had the greatest freight-carrying capacity in proportion to population of any system of government railways in the world. Our freight-carrying capacity was 8,662 tons per 10,000 inhabitants; that of Germany about 1,500 tons. We had car shortages, it is true; but they had relatively worse ones in Germany. Our railways actually moved almost five times as much freight traffic in proportion to our population as did those of Germany.

Not only have our railways, under private ownership, furnished larger facilities in proportion to population than those of other countries, but they have furnished them more economically. Some people charge that our railways are over-capitalized. Some individual companies are, but the average capitalization of all, which is about $66,500 a mile, is lower than the average cost of construction or capitalization of any other important system, government or private. The railways of Germany, most of which are government owned, have cost $120,000 a mile. Those of New South Wales, Australia, which always have been owned by the government, which have been built and developed in a new country, and which have nowhere near the capacity per mile that ours have, have cost $90,000 a mile.

When we turn to the operating results of our railways, to the rates they have made and to the wages they have paid, we find similar facts. Their average wage in 1913 was higher than that in any other country, except one of the Australian states. Between 1913 and 1916 the average railway wage in this country increased from $757 to $869; probably at present it is at least $900, and increases now in contemplation probably will advance it to $1,100. The average wage in Germany in 1913, the latest year for which the information is available, was $409.

Similarly as to rates. Our average freight rate per ton per mile in 1913, 7.29 mills, was the lowest in any country except in India, where the wages paid are measured in cents, not dollars. The only European country in which the average was less than 12 mills was France, and most of the railways of France are privately managed. The average in Germany was 12½ mills. The answer is often made, when the average rate of Germany is compared with that of the United States, that the average haul is shorter there than here; and, of course, you always have two terminal expenses, whatever the length of the haul. Those who make this answer overlook the important fact that the very high wages paid in this country enter into terminal expenses as well as road expenses; and that, therefore, assuming that the same number of men are employed, it costs more in wages to operate one terminal in this country than to operate two in Germany.

Why Has Railway Development Stopped?

Until recent years, in spite of the high wages they paid, the low rates they charged and the service they provided, the managements of our railways were able to attract enough capital into the business to go on increasing their facilities. Why has the development of facilities been almost stopped? There have been various causes, but the main one has been punitive and restrictive regulation. In 1916, when there was a sudden abnormal increase in business, the railways earned a large net return, but the tendency of net return for a long period had been downward, and this tendency was renewed at an accelerated pace in 1917. To return the railways to their owners after the war subject to the kind of regulation which has prevailed would be disastrous to both the companies and the country. Private ownership and management cannot be made a success from the standpoint either of the owners of the railways or of the public unless the owners and managers are given incentives and opportunities to increase the facilities of the railroads and to operate them efficiently.

Suppose, however, that our policy of regulation should be so altered as to afford reasonable incentives to investment and to efficient management. Would private management under such a policy probably be better or worse for the public than government management? There is nothing in the experience of our own or any other country on which to base a rational argument that government ownership and management would produce better results for the public than private ownership and management, under sane and fair regulation.

Even if you exclude our railways from consideration, a comparison of the results of private and government management in other countries argues strongly in favor of private management. Most of the railways of Germany are state managed, while most of those of France are privately managed. On any fair basis of comparison the private railways of France can be shown to be more efficiently operated than the state railways of Germany. Australia and Canada are the two greatest English-speaking possessions of the British Empire. In Australia government management has prevailed, while in Canada private management has preponderated. The private railways of Canada have made a record of efficient operation which far surpasses the record of any of the state railways of Australia.

It is only reasonable to assume that if private ownership and management are retained in this country, and our policy of regulation is so altered as to make investment in railways attractive, and to give the managements reasonable freedom of initiative and action, the expansion of railway facilities will be revived on a large scale, and the roads will be as efficiently operated as ever. On the other hand, if government ownership is adopted, doubtless the government will recognize the need for investing large sums in new facilities. But will these facilities be provided with the wisdom and economy they would be under private management? Private management would, of course, aim to provide them where the new investment would earn the largest return, and that would be where there was the largest available or prospective traffic to be handled or developed, and where, therefore, the facilities were most needed. Is there not very great danger that, under government management, the places where the additional capital would be invested would be determined not by business but by political considerations? We have had a wealth of experience with expenditures for rivers and harbors, public buildings, and army and navy posts. No-

body would contend that the expenditures have been made regardless of political considerations and where they would do the most good.

Why Government Management Would Be Inefficient

Again, what reason is there for believing that under government management the railways would be operated with as much efficiency and economy as under private management? The efficiency with which any business is conducted depends mainly on the extent to which able men are attracted into it, are given positions whose importance is in proportion to their fitness, and are afforded incentives to do the best work of which they are capable. The railways of this country have almost two million employees and about twenty thousand officers. The officers get only 3½ per cent of the billion and a half dollars paid in salaries and wages, while the employees get the other 96½ per cent. But the efficiency with which the railways will be operated in future will depend mainly on the men who are put in those twenty thousand offices and on the incentives and opportunity they are given to organize and direct to the best of their ability the work of the two million employees.

Does any man familiar with the facts have any doubt as to whether, on the whole, the policy followed by the railways or that followed by our government departments has been better adapted to securing and putting into official positions the men who are the best fitted to fill them? We have heard much recently about the alleged fancy salaries paid by the railways. As a matter of fact, the highest salaries paid by the railways are small compared with the incomes derived by many successful men from other lines of business and professional activity. It goes without saying, however, that under government ownership the salaries of the higher officers would be sharply reduced. Would the abolition of all the larger prizes in railway service increase the attractiveness of that service to men of ability and ambition? Excepting cabinet offices, with the great honor attaching to them, do we find many able and ambitious men struggling to secure appointments to offices in the government service, with the small salaries they pay? We do not; and if we adopt government ownership we shall see an exodus of men of ability out of the railroad business, rather than into it.

Even if men of ambition and ability did seek appointment and advancement solely on the ground of merit, they would not secure them. In all the government departments, except the army and navy, appointments and promotions to important offices are determined by politics, not by fitness. Government control of the railways as a measure of war has not resulted and probably will not result in political appointments, but that it would in time of peace all our experience indicates.

An answer often made to such arguments is that the postoffice department is efficiently managed. Where is the evidence? The postal department keeps its books so that nobody can tell what is the total cost of rendering its service, and it shows far less ability to meet new and difficult conditions than concerns under private management. I have spent the last five months in Washington. The great changes which have taken place there have imposed heavy new burdens on railway service, on telephone service and on postal service. Both the railway and the telephone service have met the new conditions far better than the postal service. The paper of which I am editor is printed in New York. I have never had a serious delay in getting a long distance call through to New York, and the railways run trains between New York and Washington in five hours, but recently it has been taking six days for the postal department to get the *Railway Age* from the postoffice in New York to our office in Washington. The first-class mail service, as well as the local service in Washington, have become so unreliable as almost to justify the charge that they have broken down. Congress is considering turning the telephone service in Washington over to the postal department. The postal service is so much worse than the telephone service that the proposal to turn the telephone service over to the postal department sounds like irony.

If, as seems certain, there would be under government ownership a deterioration of the official personnel of the railways and an impairment of the incentives of the officials to energetic and efficient work, the inevitable result would be a decline of the efficiency of management and operation. The adoption of improved machinery and better methods of operation, the increases in the amount of traffic handled per car, per train, per mile of track, and per employee, which have been the outstanding features of our railway operation, would be arrested. It was the large economies due to these things which long made it possible for our railways to pay ever increasing wages without advancing rates.

The Certainty of Political Interference

If there should be under government ownership a decline in the efficiency of management and operation, somebody would have to pay the bill. It would have to be paid either by railway employees in lower wages, or by travelers and shippers in higher rates, or by the public in taxes to defray a railway deficit. Who would determine what the wages, the rates and the taxes should be? It would have to be done by government officials, and in the last resort by Congress. But Congress is a political body. Inevitably, under normal conditions, it is influenced chiefly by political considerations. And so the unavoidable outcome would be that under government ownership in time of peace we should have the questions of what expenditures the railways should make for improvements and where they should be made, of the wages and conditions of work of their employees, of the appointments and promotions of their officers, of the freight and passenger rates they should charge, of who should pay the taxes to meet a railway deficit, if there was one, thrown into the maelstrom of politics. I do not say that any man or class of men would purposely throw these questions into politics. I simply say that under a democratic government such as ours, they inevitably would get into politics whether anybody wanted them to or not, and even though most people tried to prevent it.

The railways of this country employ one and three-quarter million men, to whom in 1916 they paid almost a billion and a half in wages; and an increase of $350,000,000 in wages is now under consideration. The railways, under normal conditions, spend over a billion dollars annually for fuel, equipment and supplies, and the concerns which sell them fuel, equipment and supplies employ many hundreds of thousands of men. The effect which the introduction of politics into the management of the railways would have upon their efficiency would be bad enough for the country. How much worse for the country might be the throwing into politics of the governmental power to employ, promote or discharge millions of men, and to spend billions of dollars. You may say the government in carrying on the war is employing literally millions of men and spending billions of money. But the conditions of war, the motives and influences by which people are directed and controlled in time of war, are not those of peace.

Shall We Prussianize Our Government?

You frequently encounter the argument that Germany has made a success of government ownership of railways, and that we should adopt it and could make a success of it because Germany has. If you bar Germany from the discussion, the advocate of government ownership is rendered unable to find anywhere upon earth a country in which government ownership has had results affording any reasonable basis for contending that government management has been

efficient. The argument from the experience of Germany proves too much. Accepting it at its full face value, what it proves is not that government management can be made a success everywhere, but that it can be made a success under an autocratic government. Now, doubtless by Prussianizing our government, we could fit it to do many things which it is not fit to do now. The characteristics of Prussia in the management of railways are the same as its characteristics in the management of many other things. The Prussian Minister of Public Works, who is the manager of the railways, is appointed by the Kaiser and is absolutely beyond the reach of public opinion or of Parliament. The Prussian Government forbids its railway employees to belong to labor unions, and arbitrarily keeps wages low and freight rates high to get a large revenue for its military purposes. It treats the railways as primarily a part of its war machine and applies to their employees a military discipline. For obvious reasons there are no strikes or threats of strikes over there.

Do we want to Prussianize our government to fit it for Prussianizing our railways? I have never heard anybody say so. But if we are not going to Prussianize our government, we cannot Prussianize our railways, and if we are not going to Prussianize our railways, arguments drawn from the experience of Germany with government ownership have no place in the discussion of that subject in this country.

Private ownership of railways is a democratic policy. Government ownership is an undemocratic policy. In every leading country which is fighting under the leadership of the Kaiser—Germany, Austria-Hungary, Bulgaria, Turkey—government ownership prevails. In almost every leading country which is fighting against the Kaiser, including the United States, England, France and Canada, private ownership is preponderant. The natural policy for an autocratic state is to prevent its citizens from doing anything which the state can do. The appropriate policy for a democratic state is to do nothing which its citizens can do as well as or better than the state. If, as we are invited to do, we are going to embark upon a policy of state socialism in imitation of Germany, then let us set up an autocratic government in place of our democratic government, so that we can get the efficiency in our government necessary to enable it to manage our socialistic projects efficiently. If we are not going to set up an efficient autocracy, then let us leave our business enterprises in the hands of private concerns which can and will manage them efficiently.

Surely the fact is not without significance that the most autocratic government in the world has made the greatest success of government management of railways, and that the failure of government management in other countries has been almost in proportion to the degree of Democracy of their governments. One may sincerely and ardently believe that democracy is the best form of government to secure to the citizen the inalienable rights to life, liberty and the pursuit of happiness, and be willing to fight for that belief; one may have confidence that democracy can succeed in so regulating the relations between business concerns and the public as well as between individuals and individual as to protect the rights and further the interests of all; and in spite of all this one may be convinced that so far as democratic government is as yet developed in most parts of the world, it is not a good form of government for managing commercial enterprises. Many go much further and fear that under government ownership in this country politics would so corrupt the railroads and the railroads would so of regulation the continuance in this country of private corrupt politics as not only to destroy the efficiency of the railroads, but as to destroy democratic government itself. I ask you, is it worth while to take the enormous risks involved in a change to government ownership when past experience justifies the belief that under a wise and just system ownership and management will continue to result in the provision of the most ample facilities and in the most efficient management of railways that can be found in the world?

NEXT!

The Best Cure for Such Bad Dreams Is to Wake Up and Buy Liberty Bonds

Every Railroad Officer a Liberty Bond Salesman

Three Regional Committees of Railway Presidents to Assist in Third Campaign

WITH AN ENTHUSIASM, if possible matching that reflected 3,000 miles overseas from our boys now hurrying to take their part in the pending counter drive against the Hun—with a solemn determination to show themselves worthy of those railway engineers who were with the British armies in Picardy—the supervising officers of the railways of this country are waiting the opportunity to subscribe for Liberty Bonds and the signal to begin the drive for subscriptions among the men in their shops and offices.

Railway officers have a three-fold duty in a Liberty Bond campaign—to subscribe themselves, to encourage their employees and friends to subscribe and to vie with the honor that has come to our railwaymen overseas.

Just what plans the railroad Liberty Loan campaign is to follow are not yet definite. To encourage railway officers

"COME ACROSS OR THE KAISER WILL!"

and employees to subscribe to the Third Liberty Loan, Director-General McAdoo has issued a circular authorizing carriers to take such amount of bonds as may be necessary to care for such subscriptions and to use current operating revenues as far as necessary in paying for such bonds. In paying for such bonds officers and employees may be permitted to pay in installments covering a period not exceeding ten months. In case they have not completed payments on prior subscriptions and in order to avoid making payments on both subscriptions at the same time, payments on new subscriptions may begin not later than three months from now in which even the ten months shall date from the time payments shall begin on the new subscription.

When the Third Liberty Loan Campaign begins the railways of this country are going to be even better organized than ever to assist their employees to subscribe for bonds. One committee in the first two campaigns succeeded with the co-operation of the railway officers and employees the country over in raising $56,000,000—20 million in the first campaign and 36 million in the second. This time there will be not one committee but three committees—one for each railway regional district.

The committee in the eastern district will be headed by F. D. Underwood, president of the Erie, and will consist, in addition to the chairman, of Frank Trumbull, chairman of the Chesapeake & Ohio; E. E. Loomis, president of the Lehigh Valley; L. F. Loree, president of the Delaware & Hudson; Howard Elliott, chairman of the committee on inter-corporate relations of the New Haven, and J. B. Dennis, of Blair & Co., bankers of New York. The committee has been appointed only a few days at this writing and its plans have not yet reached concrete form. But it is significant that the committee is getting on the job early in the game, much earlier in fact than the committee was able to in the first two campaigns.

Similarly there is a committee for the western regional district with office in Chicago and one for the southern district, the headquarters of which are in Atlanta, Ga.

R. H. Aishton, regional director of the western railroads, has appointed a standing committee of presidents of western lines as his Liberty Loan Committee as follows: Chairman, W. G. Bierd, president of the Chicago & Alton; J. E. Gorman, president of the Chicago, Rock Island & Pacific; H. E. Byram, president of the Chicago, Milwaukee & St. Paul; H. G. Hetzler, president of the Chicago & Western Indiana; C. H. Markham, president of the Illinois Central; A. M. Schoyer, resident vice-president, of the Pennsylvania Lines; C. G. Burnham, executive vice-president of the Chicago, Burlington & Quincy.

C. H. Markham, regional director of the Southern railroads, is sending out two special war relic trains, leaving Atlanta at 7:30 a. m., April 6, on a tour to last twenty-seven days. One train will cover central and eastern Tennessee, all of Georgia and a large part of Florida. The second train will cover portions of central Tennessee, all of Alabama, southern Mississippi and southern Louisiana. Each train will carry ten American artillery officers accompanied by French and Canadian soldiers and officers and Liberty Loan speakers.

NIPPON YUSEN KAISHA TO BRAVE U-BOATS.—Merchants in Japan who are engaged in trade with France and Italy will be glad to learn, says the Japan Advertiser, that the Nippon Yusen has decided to brave the submarines and revive its direct line between Yokohama and Marseilles, which has been suspended for some time because of U-boats' activity in the Mediterranean. The Nippon Yusen Kaisha recently decided to start a line between Yokohama and Port Said, with the object of helping trade between Japan and France. Owing to the submarine dangers, the company proposed to dispatch steamers only as far as Port Said. But now the company has put on a connecting steamer and will land cargo at Marseilles.

The World Market for American Railway Supplies

Like England, France, Japan and Germany We Must Prepare Now for This After-the-War Business

By A. Stephens

GOING AFTER THE FOREIGN MARKET in railroad supplies is like buying Liberty Bonds—good business and at the same time a patriotic duty. The business is there and our railway supply manufacturers will be missing the chance of a lifetime for themselves and will fail to do their duty by their country if they do not make the most of it. The foreign market offers new and profitable business and the present moment is the time to lay our plans. England, France and even Germany, despite their tremendous efforts in the war, already realize the necessity of preparing for the war after the war—the battle of trade that will begin with the treaty of peace—and are making most extensive plans to that end. The most progressive manufacturers in this country are doing likewise. It is just as much our duty to prepare for this great expansion in trade as it is theirs.

As Manuel Gonzales, a foreign trade authority puts it, "Because they can get it is the reason why our railway supply manufacturers will seek export trade. Coupled with the fact that foreign business is just as profitable as domestic business this is certainly a good enough reason for an American business man at any time. Yet if this opportunity of profit did not exist many sound reasons point to the conclusion that the American manufacturer should develop the foreign market as a patriotic duty to his country."

No Mystery in Foreign Trade

There is no mystery about the profitable business to be secured in the foreign field. If we will consider the rest of the world merely an extension of the territory of the United States, stretching north, south, east and west and then realize that much of this territory is suffering from a very acute shortage of railroad supplies there would be no difficulty in projecting the mind over the imaginary boundary. The fact that there are seas to cross, new languages to learn, new customs to study and new competitors to fight obscures the opportunity, it is true. Yet these conditions are merely human conditions to meet and overcome by ordinary human effort. Fundamentally they are not different from the conditions we meet every day. They are simply new conditions and offer perplexities because they are strange. At the same time the facts point to conclusions that are sure.

A World Famine in Railroad Supplies

Readers of the *Railway Age* know that the world is facing nothing less than a severe famine in railway supplies today. In many localities the famine already exists, the result either of diversion of equipment and manufacturing capacity to the needs of war or of the lack of shipping, depending upon whether the country is a manufacturing or an importing nation. Spain's railways are in fearful shape; Mexico's lines are worse. The statement is made as to South Africa that a large percentage of the locomotives are laid up for lack of materials and repair parts. The railways of South America are similarly suffering severely. Even Japan in its advantageous position has had to offer a bonus to manufacturers to hurry the construction of freight cars. Railway development in China has been brought almost to a complete standstill and China has only 6,000 miles of railway to serve nearly 400,000,000 people. Even England and France are suffering, although there the needs of war have compelled a continued high efficiency of railway operation behind the fighting fronts.

Trains in all these countries are still running and commerce has not been brought to a stop by any means, but one can realize what this means to the countries that will have the facilities for manufacturing railway equipment on a large scale after the war. The real significance of the world shortage of railroad supplies is for "after the war" business. That practically the whole world is looking to us for relief is not so important as that it still must look to us for much of its supplies after the war is over. While present conditions forbid a great development of export, excepting, of course, on allied government orders, it is evident that the great rehabilitation of the "run down" railroad systems of the world will have to come largely from the greatest source of supply. The manufacturing capacity of those who will be our competitors is not sufficient to meet the demand.

Germany as Railroad Supply Exporter

The dearth of railway supplies is perhaps the most pronounced in enemy countries. Germany was a great factor in the export of nearly all kinds of railway supplies, particularly locomotives, before the war, but in the judgment of our leading business men Germany has received a set back that will almost nullify her efforts for many years after the war. Outside of military roads the railway situation in Germany must be desperate. Because of the chaotic condition of Germany's railroad industry it took nine months to get the captured supplies out of Rumania. For the same reason wheat is rotting in improvised warehouses in Russia, while children are dying of malnutrition in Berlin and Vienna. As the war goes on this shortage in the Teutonic countries will doubtless become more acute.

In fact, Germany's weakest spot today is her railway rolling stock, according to Maurice Bavies writing in the Echo de Paris. Every locomotive of hers our airmen destroy, he says, is a vital injury to her, because she cannot replace them. He quotes the statement of a German general who said Germany could always manufacture sufficient munitions but, if she must go under it would be due to lack of railway material.

When peace arrives a bankrupt Germany will face the prospect of rebuilding her wornout railways before seeking export in an unfriendly world.

Despite these paralyzing conditions Germany is expected to make efforts to regain her foreign trade that are unprecedented in any scheme of national trade development hitherto attempted. Isaac F. Marcosson said recently:

"Germany today has secret hoards of raw material wherever it has been possible to mobilize them. The moment the war is over she is going to be a going business concern. She is a going concern in Spain today. If you could slip off the roofs of 150 warehouses in Spain you would find them packed to the doors with the oil and copper and all the other resources with which to do business, everything which Germany has mobilized in Spain as she has been mobilizing in this country from the day the war began."

Belgium's great manufacturing capacity in industrial railroad cars unfortunately has been practically wiped out. Belgium's chances of coming back are infinitely less than

Germany's. She will enter the calculation only as an importer of railroad supplies from Great Britain, the United States or other countries of the allied group.

France Will Import Railway Supplies

France was not one of the greatest competitors in railway export before the war. Afterwards she will have her hands full at home. In fact, the members of the French Purchasing Commission now in this country expect that they will continue to buy large amounts of American railroad supplies after the war. Captain Raymond Michel, head of the railroad department of the French Commission said recently:

"The salesman of American railroad supplies will have no difficulty in getting orders in France after the war. He may have difficulty in filling them because we shall be in the market for nearly everything used on a railroad. The American manufacturer who will establish a branch plant in France and do business on a French basis will stand a particularly good opportunity of getting a large amount of business. The French government and French business men will encourage such enterprises." The export efforts of the French will be in other things than railway supplies.

These conditions are expected to eliminate much of the international competition in selling to the railroad market of the world. The United States, and Great Britain should be the principal factors and Japan and Germany lesser factors in the after the war scramble for railroad business.

England Our Biggest Competitor

Britain will be our great competitor, not only because of what her manufacturers could turn out before the war, but also because of what she may be able to produce as the result of her great plans to transform war industries into peace industries. Britain was never a great producer of railroad cars, but she has been one of the largest exporters of locomotives, rails and other heavy materials.

On the basis of before the war manufacturing capacity the entire output of the British railway supply industry for one year's time would be required to provide for the immediate wants of the railroads of India alone. British efforts will be great but cannot be expected to rise to filling all the accumulated needs of her colonies and her home railways.

Japan Another Competitor

Japan is and will be another real competitor. Japan's activity in railroad supplies will be felt principally in the Far East. Her resources in coal and iron and manufacturing capacity before the war permitted Japan to export one-third of her production of railway supplies. The railroad supply industry in Japan has expanded considerably during the war, but it is still too small to offer serious competition in all parts of the world. In the course of time Chinese coal and iron mines and Chinese steel mills may be developed to the point of furnishing Japan with the materials to become a great factor in producing railway supplies.

We Have Greatest Manufacturing Capacity

Of all nations, the United States will have the greatest manufacturing capacity, the greatest resources in raw materials and probably the greatest surplus of investing capital. Our car manufacturing capacity is 350,000 per annum, something like 150,000 in excess of normal domestic production. We can easily deliver abroad 3,000 locomotives annually and supply the domestic market at the same time. In rails, car wheels, axles, sheets and plates, structural steel, parts and specialties we have a capacity that is vastly beyond our own requirements in ordinary times and which no other nation approaches. The market open for our manufacturers will include nearly the whole world.

Our financial condition is perhaps the heart of our future export situation. Investing capital is the first requirement of railroad construction in new countries. The United States has the money now and should have a relatively strong position at the end of the war.

Will Capture the World Car Market

"Provided we come out of the war in strong financial condition and provided Germany comes out with financial strength broken the American railroad car manufacturers expect to capture the market." This opinion was expressed by one of our greatest car manufacturers who has had years of experience in selling in foreign countries. Manufacturers of most other railroad supplies are not in such strong positions as the car manufacturers, but their thoughts are running in the same direction though they cannot expect to dominate the foreign field as the car manufacturers may.

American Investments Bring Export Business

The financial side of the development of our export business in railroad supplies is as interesting as it is important. Almost invariably a foreign railway buys its materials from that country whose investors supplied the capital for its construction. The investors in European countries, and particularly the Germans, took great care, however, to guarantee the continuance of this railway supply business. The English investors, for instance, sent over British engineers and operating men to run their railways and the latter brought with them a familiarity with British standards and equipment which resulted in their purchasing that kind of equipment from home in England. The Germans usually embodied in their loans a strict proviso that all materials and supplies for the construction and equipment of the railroad should be purchased of German interests. In this way they tied up the investment forever and a day and made every mark invested in a railway abroad show a quick and continued return in the sale of railway supplies. The plight of many of these German built railways today is evident. Several lines in South America and some in China are bound hand and foot, and it is not unlikely that some of the contracts at least will have to be broken.

Our own export and financial interests have adopted this method in a somewhat different form to a number of projects, many of which are now held up by the war. In our case, however, the practice seems to depend on the specifications—they are so made that only an American firm can fill them to advantage.

Our great financial institutions have put their shoulder to the wheel in promoting export by the investment of American capital. A leading investment banker said recently: "Americans have shown a new interest in investing in American built foreign railroads. We believe that when the time comes, they will put their money into railroads in South America or China, etc., just as readily as they will into a promising industrial in Ohio."

Although we cannot let the money go out of the country at this time, tentative contracts for financing and building railroads in nearly all parts of the world have been entered into by various large American interests. Construction work awaits only the signing of the treaty of peace. As far as anyone can see into the future projected American built railroads are certainties in South America, Africa, China, Central America and Mexico and, if conditions permit, in Russia and Siberia.

To leave the realm of practical certainties and contemplate what are only strong possibilities, there are several large American projects that appeal powerfully to the imagination.

One group of our financiers and business men is looking forward to the construction of the railroad that will link the Americas, North, Central and South, with continuous standard gage mileage. This road would utilize existing lines for most of the way. It would doubtless be in operation today

if it were not for the difference in gage on many of the railroads to the south of us.

Hitherto Africa has been the domain of the English, French, German or Belgian railroad promoter, but today some American built and owned standard gage mileage is assured and more projected.

A plan to connect the French railway system that goes southward from the Mediterranean with an American railroad that will continue it to the Atlantic coast in Liberia is another dream that is near to being a reality.

In China our railroad builders are prepared to build 2,600 miles of standard American railroad. They are already looking forward to the day when American built mileage will handle much of the passenger and freight traffic in some of the richest provinces of a country that supports 400,000,000 people.

The importance of these American projects is the business it guarantees in the future for American railway supply manufacturers. The American built railroads in foreign lands will supply a large part of our export market in railroad materials and equipment.

Now the Time to Prepare

The export houses and investment firms realize one thing more than anything else and that is that now is the time to lay the plans for export trade after the war. We are fighting a war that affects the prosperity as well as the political security of the American nation. England and France thus far have been far more heavily engaged than we, but they are making tremendous plans for their export business after the war. It is to our unending advantage that our war preparations will also be of value for the preparations for export trade. The exports of railway supplies that we have been making to the warring nations have brought us in contact with the foreign ways of doing business, and no one doubts that our railway engineers in France will return with ideas that will prove of great advantage from the standpoint of export trade and our commercial dealings with our friends overseas or in the other parts of the world. The shipping program has perhaps even a greater advantage, for if there is one thing that has handicapped our export trade hitherto it has been the lack of shipping under the American flag or over trade routes that were typically American. After the war we are still going to be able to use the ships that during the war will be used to carry our men and supplies to France.

Ships Are Half the Battle

"Shipping is half the battle at any time in securing export trade" is the way a large exporter of American made railway supplies put it recently. This concern had just lost a large Argentine order for locomotive tires because the freight rate from London to Buenos Ayres was $20 less per ton than the rate from New York. The reason was not that the English had established unjustly discriminatory rates. It was for no other reason than that the main trade routes of the world converge at London and Liverpool and because the route from London to Argentine had far more shipping than that from New York to the Argentine ports.

What are some of the great export plans that our allies are already at work on? Great Britain and her dominions and colonies are working out a plan of great trade routes, joining all parts of the empire with direct trunk lines whereby the great volume of tonnage will provide the lowest rates, thereby protecting the British shipper as effectively as high import and export preferential tariffs. The Dominion's Royal Commission is working out this protective measure in a broad and impressive manner. The February issue of The Americas says:

"If the idea is carried out, we will see in the future, a great empire that, instead of using political power in the form of restraint of commerce for national purposes, will use its wealth as a great business corporation would in building up a great mechanical plant for the use of its commerce with efficiencies so great that its economies will be irresistible. The master builders of England's great shipyards have contributed their expert advice to the commission, and in one of its recent reports it is shown in tabular form how the cost per ton of freight transportation can be cut to a fraction of the tramp steamer's cost by the use of immense vessels, of steam or motor type, that the commission recommends. The future may see these ships running regularly, with seasonable variations from one route to another on lines stretching out from London to the Far East by way of the Cape of Good Hope, on fast mail and freight lines involving a transfer to rail on the imperial line from London to Halifax or Quebec, thence by rail to Vancouver, thence by great steamer again to Honolulu, Sydney or to Hongkong. Or it may be along a third projected all-sea route via London, Liverpool, Halifax, Bermuda, Kingston, Panama, Tahiti, Auckland and Sydney, with alternates to Singapore and Hongkong. These will be the heavy 'trunk lines' to the Far East, with others through the Suez Canal to India and Hongkong."

This plan includes a reorganization of rates of English and colonial and Dominion railways for the benefit of the importer and the exporter. German railroads by means of government support give generous rebates to exporters and to importers of raw materials to be exported after manufacture.

The English system similarly will include both the railways and steamships and reduce all transportation rates to both exporter and importer.

Great Britain's Big Plans

Development of shipping is only part of the program of the Dominion's Royal Commission which is working to unify the efforts of the empire. Other important measures are:

1. An empire policy of preference for British industry in the supply of raw materials of which the empire has a monopoly or dominant position.

2. The establishment by government ownership or subsidy of several great steamship lines connecting the ports of the empire and an inter-imperial scheme of deep-harbor development to accommodate the ships, 660 ft. long, and 38 ft. draught, calculated to have the ultimate practical economies of freight transportation. This would make tariff discrimination unessential.

3. Government control of at least one independent telegraph and cable line connecting all parts of the empire.

4. An English national and British imperial policy of preferential employment of British capital and British institutions in the development of empire resources including the encouragement of home establishments for the primary treatment and manufacture of Dominion ores, materials, etc.

5. The foundation of the British Trade Corporation is not only to assist in the general expansion of British commerce, but to work out the financial phases of inter-imperial developments.

These are only a few planks of the broad platform of the British trade battle that will begin with the treaty of peace. Most of the measures which the British have set out to accomplish are already largely worked out. Other plans that cannot be put into operation at this time have been thoroughly mapped out and are ready to be put in operation on very short notice.

Foreign Agents Active Everywhere

England and France are not only doing now all they can to prepare for future foreign business but also are maintaining as great an export trade as is possible without reducing their efforts in the war. England's preparations for future

export business are being carried out on a scale hitherto unequalled by any country. All of her industries are being organized for bringing the whole national resources—manufacturing and financial to bear on the export field as soon as the war ends. England is a practical foreign trade country and her preparations are based on experience. Like Germany, she believes in the potency of the man on the ground. Her commercial agents swarm in all the great capitals and centers of the world. New York is full of them. The part the French will play is a minor one indeed compared to the English, but France also is active.

The British preparations are literally an economic mobilization of the resources of the whole empire. The parliament of Great Britain in January, 1916, debated a resolution:

> RESOLVED, That with a view to increasing the power of the Allies in the prosecution of the war his Majesty's Government should enter into immediate consultation with the governments of the Dominions in order with their aid to bring the whole economic strength of the Empire into co-operation with our Allies in a policy directed against the enemy.

Bodes Ill for German Trade

This policy has since been worked out with a thoroughness that bodes ill for Germany's foreign trade aspirations. All of the Allies have entered heart and soul into this preparation. The United States is a great asset to this program. The primary purpose at present is to break down the Germanic commercial organization and influence in all parts of the world and to shut off every form of aid to Germany.

The inauguration of this policy in Britain was the beginning of a world-wide movement including the United States, in which German firms have been black-listed, German trade boycotted, exports restricted by license, the sale of raw products controlled, and coal refused for ships that were indirectly aiding Germany.

In British colonies and dominions this policy has resulted in the cancellation by law of contracts with Germans, the expulsion of all resident and even naturalized Germans from all public trade bodies, the closing of telegraphs and mails and the working out of a world-wide boycott that effected not only the German mercantile establishments, but also neutral concerns that maintained close business relations with them.

The control of raw material is the most vital power in the hands of Great Britain in carrying on a war against German commercial aggression. Joined with the United States the entente Allied group could exert such a control over raw materials, shipping, trade routes, etc., that it is difficult to see how the Central Powers could maintain their existence as powerful industrial countries in a trade war after the war.

Eighty-seven British Reconstruction Commissions

All told 87 commissions and committees are working under the direction of the British Ministry of Reconstruction for the regeneration of British industry. This vast scheme includes provision for every conceivable phase of commercial activity. To determine what steps should be taken to recover home and foreign trade lost during the war and to secure new markets is part of the objective of one of these commissions of which the prime minister is chairman. Devising ways and means whereby the sources of supply within the empire can be prevented from falling under foreign control, is another duty of the same commission.

The commission on trade relations after the war is actively taking measures for the promotion of British trade and with equal enthusiasm is devising means for the prevention of the resumption of Germany's policy of peaceful penetration.

Methods whereby the endless munitions factories can be adapted to industrial purposes is an activity of the commission in the engineering trades. Seeking new industries to be adopted is another duty of this commission. How the machinery may be adapted to other uses and the suitability of the labor of existing munitions factories for other industrial work will be shown. In each case, this commission will show whether skilled or unskilled labor is needed, and if female labor can be used.

Other preparations dealing with finance, demobilization of the army, foodstuffs, control of raw materials, etc., etc., are organized under these commissions with a searching viewpoint of leaving nothing undone.

Japan Has Great Plans

What Britain is prepared to do in foreign trade has a parallel on a lesser scale in what the Japanese will do and to a considerable extent are doing now. Japanese manufactured goods are pouring out from the island empire in unprecedented volume to new markets in all parts of the world. Our Pacific Coast merchants are buying textiles and jewelry, novelties, light metal goods, etc., from Japan because our own manufacturers cannot meet the Japanese prices. Japanese goods of all kinds are being sold in great quantities in South America, Australia, Africa, India and even compete with British goods in England itself.

Japan is a formidable competitor in the export of railway supplies to the Far East. Her manufacturing capacity is not sufficient to endanger the development of American or British railway exports, but possibilities of Japanese development of these resources are great. The vast Chinese iron and coal mines are being organized under her direction. Grown enormously rich by the war Japan is preparing to father the industrial development of China. Her first activities will be railroad and mining development. She will manufacture much of the finished products at home. Her domestic railway supply manufacturing industry had a capacity of one-third in excess of her own needs at the beginning of the war but it has been greatly expanded. Japan hopes to get the raw materials such as iron and steel, sheets and plates, structural steel from the United States until she can develop Chinese iron and steel resources sufficiently to meet her needs. The whole world is preparing for a new industrial era, and Spain and Australia are striving for locomotive building capacity, Chile and Brazil are building railroad shops. Italy is looking forward to the end of the war as the time when she will harness her water power to a reorganized and electrified system of railroads when machinery will be manufactured in hydro-electrical driven plants. Brazil is pushing the application of pulverized fuel for locomotives and industrial plants because that will make available the large deposits of lignite for industrial purposes. Siberia is awakening to her needs of transportation and manufacturing. Wherever we look we see a world full of new ideas getting ready for an era of industrial development. Everywhere railroads will play the first part in this great development, because transportation is the forerunner of all material progress.

Our Own Part in This Expansion

Our railroad supply manufacturers will play a big part in this reconstruction. Much business will come to them almost without their seeking, but with so many competing interests this first rush of business is likely to be transitory unless we are prepared to give service as well as products.

The American made car, the American made locomotive and other American railroad supplies are well suited to the needs of many countries. Large unit equipment is the kind that will probably be used in future railroad construction in most of the large continental countries of Australia, Africa, South America and Asia, because the grades, long hauls and materials to be handled make for conditions similar to those in the United States for which this equipment was evolved. European equipment is generally designed for short trips. Speedy delivery in small lots is more important than large

carrying capacity. Therefore, Europe is handicapped, at the start, at least as far as competition with us is concerned, in the attempt to sell its kind of equipment in the great continental areas.

For these much of our equipment can be sold just as it is for foreign use. On the other hand foreigners have many preferences that are founded on conditions peculiar to their own countries. It is to the credit of our railway supply manufacturers that they have keenly realized this fact. They have in many cases shown the engineers on the foreign railways that many American practices could be adapted most advantageously to their problem and many cars and locomotives are going abroad with American ideas and devices on them that should be well received. On the other hand, the American manufacturers have apparently been most careful not to overstep the line. The American Car & Foundry Company is very careful not to try to run counter to any of the natural preferences of the foreign purchaser. In supplying passenger cars to Italian railroads this company recommended that the cars should be built on the compartment system rather than the American seat arrangement although the Italians had asked for cars built entirely on the American system. The American company knew that the compartment arrangement was better suited to Italian needs and wanted to avoid a come-back.

Perhaps the most notable question that has come up has been that of journal box lubrication. We have supplied American M. C. B. journal boxes on an order for Italian locomotives. The Russian cars were built very largely to M. C. B. standards and had M. C. B. journal boxes even on a large proportion of the four-wheel cars. We have supplied large eight-wheel cars with M. C. B. journal boxes to companies in France. The French use a scheme of journal box lubrication in which they have a felt pad. American railway supply companies have essayed to show the French mechanical officers the advantages of our M. C. B. lubrication, but American railroad engineers now in France have conceived a great admiration for the French felt pad arrangement. When these railroad engineers come back it is even predicted that they will make recommendations that this method be considered for adoption in this country. However, true this prediction may prove, the point is that both sides are learning with open minds. The education that will result for us, whatever the outcome, will prove of untold advantage in the trade campaign later on.

There are thus many instances in which the preferences of the foreign buyer should be followed and others where the efforts of our supply trade should be to sell its own designs.

Thinking Financially in Dollars

The purpose of this article is not so much to describe the methods of getting export business as to show that the business is there and can be had by practical business methods, and that to go after it is so important that it can be said to be a patriotic duty.

Despite the scarcity of ships much of this business is available today. This is evident from the monthly reports of railway supplies from several countries, including the United States. No matter how scarce shipping is, it is necessary to keep commerce moving on the ocean routes and railroad supplies are a necessary part of this traffic.

That the development of export is for the best interests of the country is evident when we look ahead to the end of the war. Then is when our present preparations will show a dividend. Development of our export trade is developing the resources of the country to be utilized in time of war. In times of peace export trade in railway supplies will serve to balance the volume of production of our supply factories. When bad times exist in the United States the demand for railway material is likely to be particularly brisk in South Africa, Italy or the Far East. Economists say that when the United States develops an export trade that sizes up to the immensity of her resources, bad times or boom times will no longer exist. An even measure of prosperity will be our constant condition. Export trade is already bringing the American in contact with other people with a consequent breaking down of old prejudices and the establishment of new friendships and also a broadening of the culture hitherto provincial.

The Latin is beginning to think financially in terms of dollars and he is looking to America to get the dollars for financing railway developments of his country. Export trade is needed to fill the ships that will travel abroad from the Atlantic and Pacific or Gulf ports to all parts of the world, so that by establishing a great volume of shipping to and from the United States we all may benefit by the cheapening of rates. This means the end of the Chinese wall of high freight rates that has cut us off from a full realization of our opportunity as a great industrial country. What Great Britain would be without ships is as easy to imagine as what the United States should be with an adequate merchant marine and a volume of export trade in proportion to our great resources and our national traits of initiative and business talent.

That the position of the United States is such that our preparations are sure to result in a great development of our export business is the opinion of Burwell S. Cutler, chief of the Bureau of Foreign and Domestic Commerce, who voiced this opinion recently by saying: "I, myself, have supreme faith in the genius of our commercial public to use good common sense in the contemplation of after-the-war trade. You can not make me believe that the sturdy figures who have in the last 50 years won a place for us as one of the three or four greatest world powers will ever be stampeded into fear or uncertainty on account of what competition will do. When reconstruction is actually at hand, the American business man will find perfectly normal ways of holding his own in every market of the world without recourse to any selfish national schemes designed to hoodwink our commercial brethren abroad. Indeed, it may be assumed that our trouble will be one chiefly of satisfying the tremendous demand for our goods both at home and abroad."

"ACH. THEY'VE GOT OUR RANGE AGAIN"

Why Locomotives Should Not Be Standardized

There Can Be No Justification Either in Time or Money for the Standard Locomotives

THERE ARE SO MANY REASONS against the standardization of locomotives for the railways of the United States that it is hard to understand why so much consideration is being given by the Railway Administration to this particular phase of railway operation. Unlike cars, locomotives are built to meet specific operating and physical conditions. Upon the size and design of the locomotive depends to a very great degree the efficiency of railroad operation. A design adapted to the physical and traffic conditions of one road, or even to one division of a road,

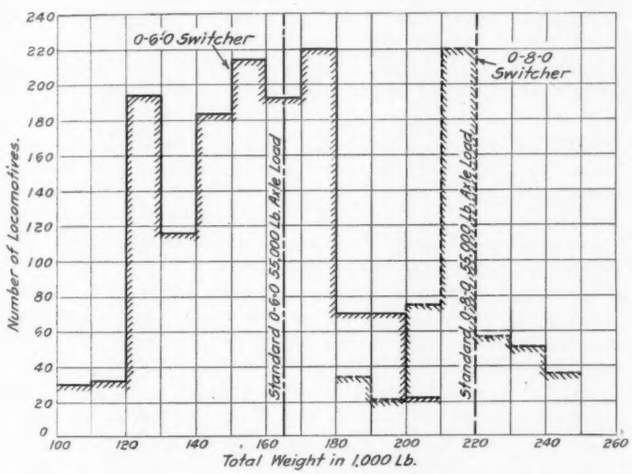
0-6-0 Switcher
0-8-0 Switcher
Standard 0-6-0 35,000 Lb. Axle Load
Standard 2-8-2 55,000 Lb. Axle Load
Number of Locomotives.
Total Weight in 1,000 Lb.

Fig. 1—Number of Six and Eight-Wheel Switchers Ordered During the Past Five Years According to the Weights

may be unsuited to the conditions of another road, or another division of the same road. To effect greater increases in the efficiency and economy of operation, the railroads have given much study to the proper characteristics of the locomotives to be used, and to upset such carefully laid plans by the introduction of standard locomotives, which at best must be of a compromise design and can only be made to meet average conditions, is a decided step backward.

There is ample justification for the standardization of freight cars. Due to the extent to which such cars are interchanged between roads and because of the fact that such a large amount of repairs are made on foreign lines, it is entirely proper that a certain degree of standardization obtain in order that these repairs may be made promptly and that the repaired parts be interchangeable, so that the number of such repair parts to be carried in stock may be maintained at a minimum. This, the chief argument in favor of standard cars, does not apply to locomotives. Locomotives have not and should not to any great extent be interchanged between roads if the best results in train operation are to obtain. The experience of the past few months with locomotives that have already been interchanged will show clearly the inexpediency of such practice.

There are six distinct problems that must be considered carefully in the discussion of standard locomotives today. They are first cost, increased locomotive production, operating efficiency, development in design, locomotive repairs, and the expediency of such an experiment in time of war.

It is, of course, an indisputable fact that the cost per locomotive will be less when a large number of locomotives of the same design are built, than the cost per locomotive when the same number of locomotives are built to the same general weight, but of different designs, provided that in both cases all of the designs are new. It is, however, a grave question whether locomotives of a new design, of a number which will probably be built this year, can be built any cheaper than locomotives of existing designs for which all the manufacturing equipment has been provided. In building any new design of locomotives, such as the new standard locomotives, there will be a large expense for the time taken to develop the designs, for making new drawings, patterns, templates and jigs, and other manufacturing equipment which is necessary to the construction of any locomotive. Prices for such locomotives must in all fairness to the builder, include the extra cost occasioned by developing the new design. Were locomotives of existing designs built, this extra cost would not have to be considered, as it has already been absorbed by the first locomotives built to those designs.

First Cost

There is another point concerning which but little has been said and which will add a considerable amount to the first cost of the standard locomotives. The following argu-

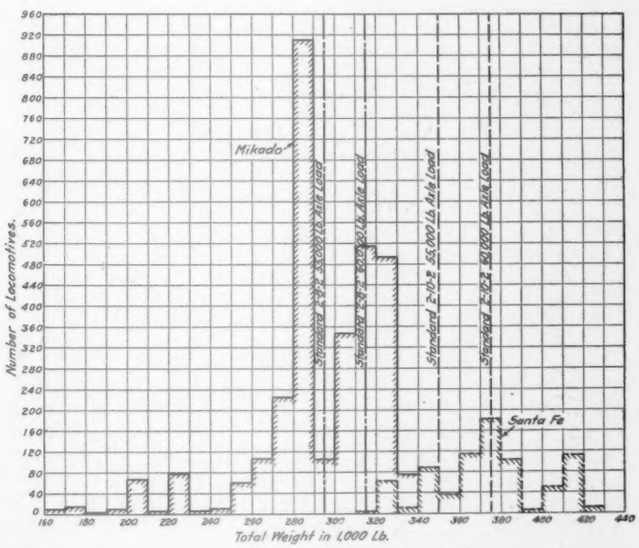

Fig. 2—Number of Mikado and Santa Fe Type Locomotives Ordered During the Past Five Years

ment is based on what is believed to be the government's plans, namely, that 12 designs are to be built, having approximately the following total weights:

Six-wheel switcher	165,000 lb.
Eight-wheel switcher	220,000 lb.
Pacific type (55,000 lb. axle load)	270,000 lb.
Pacific type (60,000 lb. axle load)	285,000 lb.
Mountain type (55,000 lb. axle load)	325,000 lb.
Mountain type (60,000 lb. axle load)	345,000 lb.
Mikado type (55,000 lb. axle load)	295,000 lb.
Mikado type (60,000 lb. axle load)	315,000 lb.
Santa Fe type (55,000 lb. axle load)	250,000 lb.
Santa Fe type (60,000 lb. axle load)	275,000 lb.
2-6-6-2 type (55,000 lb. axle load)	400,000 lb.
2-8-8-2 type (55,000 lb. axle load)	500,000 lb.

The manner in which the first ten locomotives will fit into the requirements of the country is well illustrated in Figs. 1, 2 and 3. Fig. 1 shows the number of locomotives ordered during the past five years, by weights, for the six-

wheel and eight-wheel switchers. Heavy vertical lines are drawn at points representing the approximate weights of the standard switchers. The same is shown for the Pacific and Mountain types in Fig. 2, and for the Mikado and Santa Fe types in Fig. 3. From these charts it will be seen that if the government builds only those standard locomotives

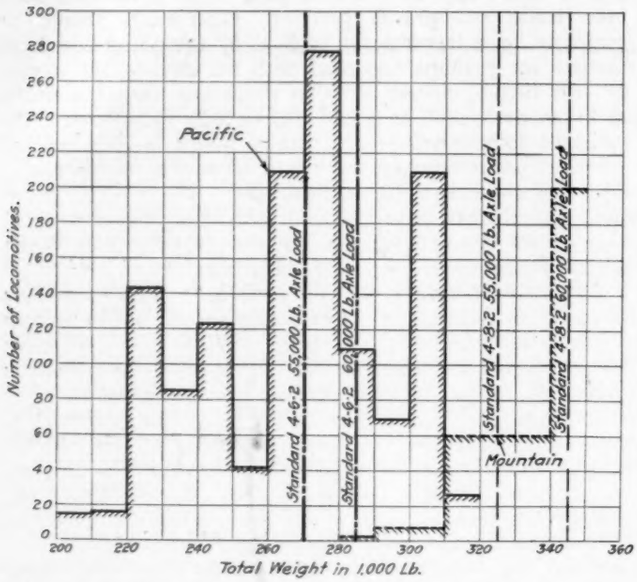
Number of Locomotives.
Total Weight in 1,000 Lb.
Pacific
Mountain
Standard 4-6-2 55,000 Lb. Axle Load
Standard 4-6-2 60,000 Lb. Axle Load
Standard 4-8-2 55,000 Lb. Axle Load
Standard 4-8-2 60,000 Lb. Axle Load

Fig. 3—Number of Pacific and Mountain Type Locomotives Ordered During the Past Five Years

which it is now considering, many roads will be furnished, if the same requirements obtain as in the past, with power that is either too heavy for its demands, or of a more complicated construction. For instance, those roads that could economically use Pacific type locomotives weighing less than 270,000 lb.—and as the curves show there will be quite a number—will be obliged to use a heavier locomotive. Those roads that have found it desirable to use Pacific type locomotives weighing over 300,000 lb. will either have to take the standard Pacific weighing 295,000 lb., which will be deficient in tractive effort, or take the more complicated design of the 325,000-lb. Mountain type.

The first cost of the locomotives will from such an analysis appear to be greater inasmuch as heavier and more complicated locomotives will be required for services in which locomotives of less weight could be used. For instance, last year there were 367 Mikado type locomotives ordered, each of which had a total weight below the 295,000 lb. standard. The sum total weight of these locomotives was in the neighborhood of 97,000,000 lb. If the same requirements obtain this year, and there is no question but what they will, the need for the 367 locomotives would undoubtedly be filled by 367 standard locomotives which would have a sum total weight of about 108,000,000 lb. In other words, about 10,000,000 lb. of locomotive material—1,000,000 being subtracted for water in the boiler—would be required to fill these requirements under the standardization program. Taking a conservative cost of locomotives at the present time as 15 cents per pound, in this particular case the increase in first cost, due to the fact that standard locomotives are being used, would amount to $1,500,000. There is no question but what last year's requirements will be doubled this year and it can safely be said that the loss in first cost of the lighter Mikado types will easily reach $3,000,000, if they are to be supplied by the standard locomotive. This does not take into consideration requirements for Consolidation locomotives which will still further increase this sum.

It may be argued that on account of the increase in tractive effort, an equivalent number of standard locomotives would not be required for these locomotives. If the work of all of these 367 locomotives were concentrated at one point, this would undoubtedly be true, but these locomotives were purchased for use in various parts of the country and they were not built as heavy as the standard locomotives, as the conditions did not require locomotives of such capacity.

This same line of argument can be applied in the case of all the other types to the extent that it will be safe to say that millions will have to be spent for excess locomotive material if the standard locomotives obtain. It is hardly conceivable that any savings that could be made in manufacture, could be enough to counteract these additonal costs.

Increased Production by Standardization

As an abstract proposition, the output of any plant can be increased if the work done in that plant is systematized to the extent that it produces but one product year in and year out. In the case of locomotive construction, standardization will to some extent aid in reducing the time taken for making the various parts after the program gets thoroughly started. But will this mean increased locomotive production? The foundation upon which the locomotive builder's plants and the locomotive repair shops is based is the number of pits, or the erecting shop space. In other words, the erecting shop is the neck of the bottle in locomotive construction. The various manufacturing departments have been designed and arranged to keep the erecting shop working to full capacity. The question then is, how much can the erecting shop forces speed up their work if they have large numbers of one design to assemble rather than small numbers of different designs. Men in authority have expressed the opinion that this would have but little effect on increased output, but that it may have some.

With conditions as they exist today, however, the inauguration of standard locomotives at this time bids fair to interfere greatly with the output of locomotives this year. About the time the Railroad Administration decided to investigate the problem of standard locomotives, the railways were forbidden to place orders for new locomotives. Instructions were given the builders to place existing domestic orders ahead of all foreign orders. As the matter stands today, the builders due to lack of orders and the fact that the work on foreign locomotives has been held up, have open space beginning in June or July. Unless orders are placed immediately, the materials cannot be assembled or made ready for erection by that time. It has been estimated by those who know that from the first of April every day's delay in placing orders for locomotives means a decrease of about ten locomotives in the year's output.

It has been said by some that deliveries of the standard locomotive can be made within two months after designs have been definitely determined upon. Such a statement represents the utmost optimism. It is difficult to see how with all the detail work that must be done in connection with any new design, together with the condition of the material market today, the innumerable details can be designed, the patterns, jigs, templates and castings made, machine work done and the locomotive erected in two months. Others say that this can be done in three months, but even that is optimistic. Until such time as the standard designs can be determined upon, and this by no means should be done in a hurry, the locomotive builders should be kept working to capacity, if necessary by orders from the individual lines.

The business of the railroad is transportation. Its measure of efficiency is the cost for transportation per ton-mile. It was the aim of every road to bring this cost per ton-mile to a minimum. The locomotive plays a very important part in reducing this cost. The many different conditions surrounding railroad operation make it necessary carefully to design the hauling unit if the different conditions are to be met economically. A locomotive usually operates over a distance of not more than 150 miles. There are probably

2,000 such engine divisions throughout the country. Many of these, of course, are similar in nature, but each with its physical limitations and its traffic conditions must be given careful study that the most economical method be followed in getting the trains over the road. Water and fuel conditions affect the detail design of the power to be used.

Operating Efficiency

It would be folly to place powerful locomotives on single track lines whose sidings would not permit the length of a train that could be hauled by the locomotive. It would be a waste of money to sacrifice the high wheel engine of the plain for the low wheel engine of the mountains, simply for the sake of standardization. Considerable money has been spent to strengthen tracks and bridges for the purpose of using more powerful locomotives which have wheel loads heavier than those contemplated by the government. It would be impractical for the sake of standardization not to take advantage of these improvements by using the heavier axle load locomotives which can be operated more economically. There are many, many cases where locomotives of special design, built to meet the special requirements of division or road, have made possible a material decrease in operating costs. To upset such carefully laid plans by requiring the use of a locomotive which must of necessity be a compromise design, removes the incentive for further study along these lines, and increases the operating costs.

It has been said that many roads today are operating locomotives of similar design, the only difference being in some minor detail which was more or less a hobby of the chief mechanical officer. In such instances there is no question but that the same design of locomotive could be used on such roads, but there are many other instances where the operating conditions are so different that to insist upon the use of standard locomotives would be to give the operating men inadequate tools with which to do their work.

Development in Locomotive Design

With the fixing of any standards there cannot help but be a feeling that it is hopeless to further improve "our power." The quotations are used advisedly, for there is nothing so close to the heart of a railroad mechanical man as the locomotives he has under his jurisdiction. He is constantly seeking to further improve their efficiency and capacity, and make them operate better and do more work. This, of course, results in a number of idiosyncrasies and whimsical things which find their way on locomotives throughout the country, but be that as it may, the careful study and interest that has been taken in the locomotive by the men that operate it, has made it as efficient as it is today. By standardizing, the initiative for further improvements and betterments is removed from these men. It is no longer "their" locomotive, but "something somebody has designed who does not know our conditions."

This psychological view of the situation is one that enters into the problem of standard locomotives to a large extent. There is hardly a railroad mechanical man who does not think his power is better than that of his neighbor. It is this attraction in the railroad game that keeps the men on the job at, in many cases, ridiculously low wages. It is these men who from their practical experience in handling the locomotives, provide their roads with power which on other roads would not make nearly as good showing.

The railway supply concerns have been a great factor in developing the locomotive to its present standing. This industry has devoted large sums of money to development work and has among its organization the experts in their respective lines. The country cannot afford to standardize locomotives to the extent that any incentive for these companies to still further improve their products be removed. In most cases, a new device that is developed is experimented upon on locomotives of roads that had the conviction of its merit and the courage to try it. This has been necessary in order that the device be properly developed. Such practices should not be discontinued even though all the railroads are compelled to purchase none but standard locomotives. If it is, the development work which has done so much for locomotives during the past five years will be greatly handicapped. Further, after such experiments have been made and proven practical, experiments should be continued on a larger scale, such as by equipping new locomotives for perhaps one road with the device that it may be still further developed. To equip any large quantities of locomotives, such as would undoubtedly be ordered if the standard locomotives are to obtain, would be perhaps impractical on account of the extent to which the particular device in question has been developed. To this end, therefore, it is highly desirable to permit the roads for which locomotives are to be purchased by the government to specify the appliances to be used on those locomotives.

Naturally, if development is to continue along these lines as it has in the past, standardization should not be carried beyond the basic locomotive design. While it is understood that the plans and specifications are about to be submitted by the government, it is not known just the extent to which the standardization has been carried. If the same policy is to be followed as was followed in the development of the designs for standard cars, there need be no fear for any serious restrictions on this point. If by standardization any incentive is removed from either the railroad men or the railway supply men, future development will suffer.

It is hard to believe that good designs of a set of locomotives which are so radically new, could be developed in the time allotted to the designing committee by the Railread Administration. The problem is such an all-important one and bears such a vital relation to the future efficiency of our railroads that it is deserving of the most careful attention and painstaking investigation. According to report, as soon as the designs have been completed and approved, large orders will be placed immediately. If by any chance a mistake has been made in any design, the effect on the railroads would be that many times worse.

Locomotive Repairs

The railroads have in the past standardized to a certain extent the various details of their locomotives in order that repairs may be easily made and that the amount of material to be carried in stock may be reduced to a minimum. Almost every road has what is called standard practices, which are described both by drawings and instructions in folio form, in order that the standards of repairs will be the same in all of the main shops and enginehouses. Their locomotives are built to meet these detail standards. Special tools, dies, patterns, templates, jigs, etc., have been developed to meet these standards so that repairs may be made at less cost.

With the introduction of standard locomotives, these standard practices would have to be revised to a very large extent. New facilities for making repairs would have to be created and the foremen and men in the shops would be obliged to readjust themselves to many little detail changes that would be found in the standard locomotives, all of which would materially interfere with the output of the shops and create a confusion that the country could ill afford to experience at this time. This matter is a tremendously important one and must be given very careful thought. The railway shops of today, taking the country over, are wholly inadequate for handling the repair work on the locomotives the roads now have. There is hardly a road in the eastern territory but that will own up to a deficiency in this respect. The shop and terminal facilities for maintaining locomotives have not kept pace with the improvements to the locomotives. To overtax these shops further by calling upon them to repair locomotives with which they are not familiar and for which they have not the proper facilities

will greatly increase the burden of the already overtaxed facilities. An excellent illustration of the difficulties that will be found in the repairing of the standard locomotives may be found in any railway shop that is now called upon to repair locomotives for other roads.

The fact that any standard locomotive would be a foreign locomotive to all roads makes the problem increasingly serious. Furthermore, as was pointed out above, in a large number of cases heavier locomotives will be provided for certain work which was done before with smaller power. This again will increase the difficulties in making repairs. With the introduction of any large number of heavy locomotives on the railways must come a material improvement in the shop facilities. Some roads have adopted larger power without increasing their facilities and are well able to testify exactly what this means in decreased shop output and inefficiently maintained power. While, of course, the repairs to the standard locomotives do not loom up as being a vital question in the immediate future, it must be remembered that it is a question which will have to be met about a year hence. The lack of repair facilities during the past winter was responsible to some extent for the deficiency in motive power. With a design of locomotive which is new to all of the roads demanding repairs a year from now, which perhaps might be a more critical period than the present, it behooves every one who has to do with the establishing of the standard locomotives, to give this matter the most careful thought.

Regardless of the arguments against the standardization of locomotives as an abstract proposition, and assuming for the moment that there are certain substantial benefits to be obtained by standardizing locomotives which make it expedient at least to build from 4,000 to 5,000 of them, should we undertake such a gigantic experiment at this time when the country is at war? There can be only two logical reasons for building standard locomotives as a war measure. The first is an increase in the production of new locomotives, and the second is a reduction in the cost of locomotives. The answer to the first question may be found in the section discussing the production. The answer to the second question is found in the section discussing the first cost. The condition in the locomotive market today is such that the very consideration of standard locomotives is in danger of decreasing the output of the builders for the year. In the matter of first cost it is shown that money will be wasted, because the locomotives will be provided that are heavier than necessary and, therefore, more expensive. Added to this, the increased cost of operation of the locomotives and the increased cost that must arise from their repair would make it appear that the introduction of standard locomotives at any time would result in a net loss rather than a saving.

Conclusions

It would be far from constructive if this article should close without offering some suggestions as to what can be done to do what the government is evidently trying to do by the inauguration of standard locomotives, namely, improving the motive power situation the country over. The motive power situation of the railroads of this country can be improved; (1), by properly maintaining the locomotives that are in service at the present time and bringing them up to serviceable condition; (2), by increasing their capacity by the addition of devices, which have been found to increase the service and give more power to the locomotives; (3), by improving engine terminals in order that locomotives may be turned more promptly than they are now; (4), by properly loading locomotives to their full capacity; (5), by properly despatching locomotives over the road; (6), by giving the railroads locomotives best suited to their conditions and which may be easily repaired by them; (7), by giving priority orders so that the builders may obtain material for new locomotives; and (8), by placing orders for locomotives immediately.

Signal Department Encounters New Problems

Shortage of Labor and Delayed Deliveries of Materials Hinder Work. Outlook Good for Much New Work

AT THE PRESENT TIME the signal field is quiet. This condition is a result of the uncertainty regarding railway affairs, although this uncertainty is disappearing rapidly and the outlook for the signal department organizations and work is decidedly bright. As the director general expects to spend from one to two billion dollars on the railroads this year, it is to be expected that the signal departments of the country will come in for their share of this expenditure. The location, class and kind of work will depend upon the necessity for the protection and development of facilities to meet the country's present and expected needs under war conditions. Another consideration that will also govern will be the needs of the lines under unified operation rather than their needs as individual carriers.

The greatest opportunity in the history of American railways is presented to the signal engineers of the country today to demonstrate the value of signals in the movement of the heavy war-time traffic. The future progress in the signal field very largely depends on the manner in which the present situation is handled by signal officers. It is logical to assume that an optimistic view is warranted when it is considered that no other class of work can be installed in as short a length of time, with less expense and with less labor, which will increase the traffic capacity of existing tracks to an equal extent.

The construction work that has been carried on during the last three months has been mainly that which had been started prior to January 1. Very little new work has been contracted for or authorized this year. General order No. 12, issued by the director general, will be the guide in determining the kind of signal as well as other work which should be installed. The work which should be undertaken first is that in connection with unsignaled lines which have reached their maximum track capacity and over which it is necessary to move still more traffic. The importance of the installation of interlocking plants should also not be overlooked, as material savings may be effected at a large number of busy points by the elimination of stops by heavy trains, facilitating train movement and preventing considerable wear and tear on rolling stock.

Possibilities for economy in the handling of traffic should be considered very thoroughly and where it is found that an installation of signals will better conditions materially, even though the track capacity has not been reached, it is important that such installations be made. While work which has been under way for some time has been hampered by the delay in receipt of materials, this is a problem which can and no doubt will be remedied by the priorities board. Construction work can also be greatly facilitated by the ordering of material, where practicable, a year or two in advance.

Some of the work now under way, nearing completion,

or contemplated, is referred to below. While it is not complete for the country, it is indicative of the class and character of work which will undoubtedly be undertaken in connection with new programs.

Work Now Under Way

The *Alabama & Vicksburg* is just completing automatic block signals on 11 miles of road, with the expectation of putting them in service within 60 days. The management proposes to install automatic signals on 11 miles additional, but has taken no action thus far except to recommend this improvement to the director general.

The *Atchison, Topeka & Santa Fe* is to install mechanical interlockings at Atchison, Kan., orders for which were recently noticed.

The *Atlantic Coast Line* has authority outstanding for the construction of a mechanical interlocking plant near Marion, S. C., with six levers of the cabin door lock type; one at the Roanoke river draw with a five lever mechanical machine, and one at Orient, Fla., with a nine lever mechanical machine of the cabin door lock type.

The *Boston & Maine* has completed one interlocking plant during the past three months. Plans are ready for the early installation of a number of other interlockings, and also some semi-automatic signals at entrances to yards; also several "automatic flagmen" for highway crossings; but the difficulties of the manufacturers in securing raw material and the impossibility of agreeing on prices except where the contracts can be closed at once, have greatly enhanced costs, delays and other difficulties.

The *Boston Elevated,* in connection with its extension northward to Everett, Mass., 3 miles, is installing 14 automatic block signals and is making extensive changes and additions to its interlocking at Sullivan square, Boston, where the new extension leaves the existing line. Light signals are used throughout this improvement.

On the *Buffalo, Rochester & Pittsburgh* work has progressed on interlockings at C. & M. Junction, Pa., and at Brockwayville, Pa., since January 1, and on the installation of signals on the second track between Marion Center, Pa., and Home. This work will all be completed in the near future.

During the past three months the *Baltimore & Ohio* has completed two temporary interlocking plants at Annapolis Junction, Md., which were needed in connection with the movement of traffic to and from Camp Meade; a 48-lever interlocking at the west end of the Magnolia cutoff; the changing of the signals on a single track line to double track for about 23 miles in Indiana, including interlocking at a passing track at Bremen and automatic signals between Hamilton, Ohio, and Toledo, on the Toledo division, sufficient to provide continuous automatic block signal operation from Cincinnati to South Lima, 130 miles, with the exception of one short section in Dayton. At Bremen, Ind., take-siding indicators and leave-siding indicators have been provided, both of which are controlled from LaPaz Junction. Every effort is being made to complete extensive additions to the automatic signals between Cumberland, Md., and Connellsville, Pa., between Willard, Ohio, and Greenwich, and between Willard and Attica; but the progress of this work has been hampered by the scarcity of labor and by slow delivery of material.

On the *Chicago, Burlington & Quincy* 47 miles of double track automatic signals between Mt. Pleasant, Iowa, and Ottumwa, which have been under construction for some time, are now approximately 90 per cent completed. A number of interlocking plants on this road are also being repaired or rebuilt and are about ready to go into service again.

The *Erie* has completed automatic block signals on 35 miles of double track line from Lomax, Ind., to Griffith during the past three months. It is also hoped to start work during the present month on an extensive interlocking plant at Salamanca, N. Y., and at three other large plants.

The *Grand Trunk* is installing automatic block signals on its line in Maine, about 30 miles, single track. High cost of materials and shortage of labor have thus far prevented the completion of further plans.

The *Great Northern,* as noted in the *Railway Age* of February 8, is to install automatic block signals on its line in Montana, 31 miles, and in Minnesota, 11 miles.

The *Illinois Central* has been building automatic signals on 198 miles of single track and 12 miles of double track which will be put in service about July 1. An electric interlocking plant at a junction with the Michigan Central at Pullman Junction, Chicago, will be ready for service about April 20, while an interlocking plant at Baton Rouge, La., will be completed about the middle of the summer.

The *Jacksonville Terminal Company,* Jacksonville, Fla., has ordered material for two interlockings, tower 1, and tower 2, at its new terminal.

The *Lehigh Valley* has ordered a 38-lever interlocking for Easton, Pa.

The *Louisville & Nashville* is making extensive additions to its electric interlocking plants at Louisville, Ky., and Amqui, Tenn.

The *Missouri, Kansas & Texas* has ordered materials for an interlocking plant, 12 levers, at Clinton, Mo.

The *New York Municipal Railways* has substantially completed all of the signaling in the Broadway subway, Manhattan, and across the Manhattan bridge between 42nd street and the Brooklyn end of the bridge.

The *New York, New Haven & Hartford* has under construction about 80 miles of automatic block signalling, of which a small part is four-track line and the rest two-track; and in addition has prepared plans for about 72 miles additional; but in the present situation as to scarcity of help and delays in delivery of raw and manufactured material, no definite calculations can be made as to when this work can be completed. The additional lines included in the budget since the report made in January are those from Boston Switch, near Providence, R. I., to Readville, Mass.; from Devon, Conn., northward to Waterbury Conn.; and from Hopewell, N. Y., to West Pawling, N. Y. The extensive improvements in existing interlocking plants, reported in January, are still under construction, rather slow progress being made.

In connection with passing sidings on the main line between New Haven, Conn., and Boston, Mass., 157 miles, operated by the controlled manual block system, about 25 outlying switches are to be provided with low-voltage switch movements, and operated and controlled from towers, usually about one mile from the switches. These switches will be provided with home signals.

The *Norfolk & Western* has completed the installation of automatic signals between East Radford, Va., and Atkins, a distance of about 58 miles, during the first quarter of 1918. It is expected that automatic signals will also be completed between Atkins and Bristol during the next few months. The following work was also authorized in 1917: installation of automatic signals between Naugatuck, W. Va., and Fort Gay for the purpose of shortening the present blocks from two miles to one mile in length; installation of automatic signals in connection with the extension of the electrification from East Vivian, W. Va., to Farm and Wilcox; installation of double track in North yard, approximately 4 miles. Additions to the interlocking plant at Glen Jean, Ohio, to take care of the C. & O. N. connection.

The *Nashville, Chattanooga & St. Louis* is engaged on the construction of the large electro-pneumatic interlocking plants at Nashville, noticed in our Annual Review Number of January 4, but material is being received so slowly that only a small gang of workmen can be kept busy.

The *Pennsylvania* has been able to complete some of the

work started in 1917 and in 1916, notwithstanding the generally slow receipt of material. This includes the Woodlands Tower interlocking on the Philadelphia Terminal division and an 8-lever mechanical plant at Phelps Junction, N. Y., on the Elmira division. Automatic signals of the position-light type are now in service between Rahway and South Elizabeth, Sunbury and Selinsgrove Junction, Schuylkill River bridge and North Philadelphia. The Chestnut Hill branch installation is coincident with the extension of the electric train service on that portion of the system and carries with it the building of a new electro-mechanical style P-4 U. S. & S. Co. interlocking at Chestnut Hill. This plant will have eight electric and four mechanical levers. Thirty miles of position-light automatic signals on the N. Y. P. & N. are about ready to go into service. In addition to the above work, a number of changes have been made in existing installations and plants.

The *Pennsylvania Lines West of Pittsburgh* will install a mechanical interlocking, 35 levers, at Boone, Ind.

On the *Philadelphia & Reading* construction will soon start on an A. C. signal installation between Delaware river bridge and Hillman, Pa. An extension of the present signal system to Bound Brook Junction, N. J., an addition of 12.6 miles of four track road is also contemplated. Construction will soon be started on five new interlocking plants, while changes or additions will be made to the present plants at five other points.

The *St. Louis-San Francisco* has ordered a mechanical interlocking, 35 working levers, to be installed at Durant, Okla.

The *Southern Railway* (*C. N. O. & T. P.*) has ordered, as noticed in the *Railway Age* February 8, automatic block signals for its lines in Kentucky and Tennessee, 46 miles, to take the place of automatic signals of earlier types.

The *Washington, Baltimore & Annapolis* is to install automatic block signals on 14 miles of its (electric) line, double-track, to accommodate the increased traffic due to the establishment of Camp Meade.

General Maintenance Conditions

During the past three months the railroads of the United States have passed through one of the worst winters in their history, marked by extreme cold weather over the greater part of the country and by very heavy snowfalls through the middle west. In spite of the combination of the extreme weather and the heavy transportation requirements the signal property at the close of winter was normal in practically all cases. This condition is the result primarily of the fact that maintenance work is taken care of during the summer and the late fall in order to get all signal apparatus in shape so that the least amount of work will be required during the winter months. The needs for the present year are with very few exceptions practically the same as have confronted the railroads in previous years at this time and no extraordinary measures should be necessary to maintain the signals in proper condition. The maintenance programs on a large number of the roads are practically up to schedule owing to the fact that safety in signal operation depends primarily upon such care, and this work can not be deferred.

The extent of the maintenance work to be undertaken during the present year necessarily depends upon the attitude which the government will take toward such work, this attitude no doubt conforming to such recommendations as may be made through the regional directors to the director general. Some roads are making requests for their regular maintenance appropriations and are outlining their work accordingly until such time as definite information may be obtained as to whether the appropriations will be authorized. Other signal department organizations, while submitting their regular maintenance programs for the coming year and asking for appropriations to cover, find that these are being restricted to a certain extent by the officers on their roads. In general, plans are being made to carry on the maintenance work as it has been handled heretofore.

The worst condition encountered during the past three months was in connection with the operation of interlocking plants. The main trouble experienced was in keeping the plants cleared of snow and ice and open for operation. This condition was brought about by the lack of labor more than any other one contributing cause, although even with this shortage of labor the signal departments generally were able to keep interlocking open ahead of any necessary traffic moves that were to be made over them. Some of the roads utilized their construction forces on interlocking plants during this period, while waiting for necessary materials to arrive to continue work which was under way.

Material Situation

While the material situation confronting the signal departments of the country looks bad, the prospects are bright for an early solution of this trouble. On a number of roads new work has been suffering for a lack of material, and maintenance work has also been interfered with to a certain extent. Some roads have had material ordered for over a year which they have not yet received. Other roads report no great difficulty with delayed material as they have anticipated their wants as much as a year and a half or two years ahead and as a consequence have been able to keep the work moving. The troubles encountered in securing material are due primarily to three conditions, the difficulty the manufacturers are encountering in obtaining raw materials, the labor situation and the effect of priority orders. While the situation at present is bad, the future may be considered as bright since the government can arrange for manufacturers to obtain the raw materials necessary, and the priority orders can be used to the advantage instead of to the detriment of this class of work.

Labor Situation

The signal department, in common with other branches of railway service, is hard hit by the shortage of experienced men. For the class and nature of work the labor turnover is entirely too great. Maintenance work is beginning to suffer on many roads. The new men coming into the service often regard the work as temporary until something better offers. It is impossible to get such men enthusiastic over their work and unless they are enthusiastic and interested, the work suffers. It has been found necessary in some cases to lengthen the territories of the maintainers in order to put an experienced man over each section, giving him inexperienced men as helpers and lampmen. It has been found necessary on some roads to conduct an educational campaign among the new men entering employment, this taking the form of lessons and practical questions which may be considered as part of their regular work.

Federal Valuation

During the past three months the work carried on by the government in the valuation of signals and interlocking has been mostly in the southern part of the country where the average mileage of line inventoried per month is greater than that covered in the north. This is because signaling on the southern lines is not as heavy as that on the trunk lines in the central west and the east. The railroads are now confronted with a lack of men in the valuation department and the work is handicapped accordingly. Unless it is intended to place final figures of value on the railways on which inventories have been made, many railway men consider it advisable under present conditions to postpone such work, employing the men engaged on valuation in other capacities more essential to the winning of the war.

Sir Wm. Mackenzie *Lord Shaughnessy* *A. H. Smith* *H. G. Kelley*

Executive Committee of Canadian Railways' War Board

Brain-Racking Problems for Canadian Roads

Winter of Unparalleled Severity; Shortage of Equipment; Unprecedented Business

By J. L. Payne

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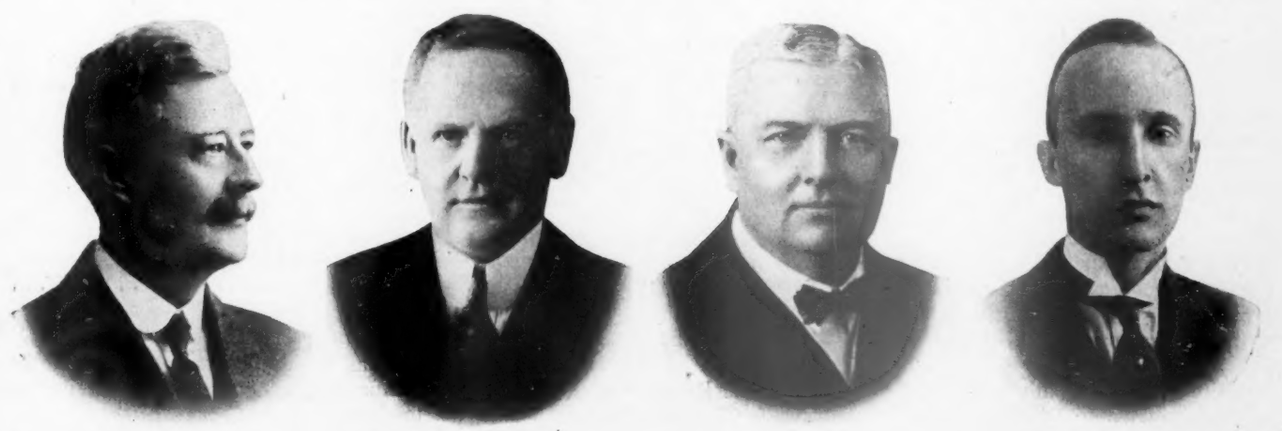
TRAFFIC AT ALL TIMES being the reflection of commerce, it is not surprising that the railways of Canada throughout the year 1917, and down to the end of March, enjoyed uninterrupted, though qualified, prosperity. Their gross earnings for the past 15 months have been unprecedented as to volume, which is another way of saying that freight tonnage has been moved on a steadily rising scale. The official statistics are not yet available, and it would be unsafe to speculate in terms of dollars as to what has been won by way of net operating revenue; but it is unnecessary to have definite figures in hand in order to forecast a decline in the final credit balance. Railways have no occult nor other means of working miracles, and therefore, while business has been exceedingly active, profits have been undoubtedly reduced by conditions. There was no escape from the stern forces which have operated to make the movement of traffic unusually difficult and costly.

The winter of 1917-18 was unparalleled in severity, from the railway standpoint. We have had cold dips in the past. They are inseparable from our northern climate. But we have never had such prolonged periods of low temperature. It was peculiarly difficult to maintain a free movement of trains under such circumstances. Even though the overworked boiler was willing to keep up an adequate supply of steam against an abnormal condensing pressure from without, the human factor at all times has its limitations. Men could not do their full part in such a struggle against paralyzing cold. The fall of snow has also been above the average, but not seriously beyond it. Drifting gave more trouble than mere depth of snow. Long spells of intense cold, however, created the most serious obstacle to comfortable and satisfactory operating conditions. Nature was in a hostile mood, and made the railways pay her price.

Shortage of Equipment

Trying as was the cold, deep as were the drifts, chilled as were the men who carried on the freight, there was another adverse force against which courage, endurance and skill



J. H. Walsh *Sir George Bury* *U. E. Gillen* *W. M. Neal*

Members of Administration Committee of the Canadian Railways' War Board

were unavailing. There were not enough locomotives and cars in the Dominion to meet the demands upon the railways. In mathematics three will not go twice into five. In the railway realm an equally inexorable law prevails. It was impossible to make three cars serve where four were imperatively needed; and that about sums up the situation during the past 15 months. In 1914 the railways of Canada made a very substantial addition to equipment, following the prosperous year 1913. Then came the most severe pinch of adversity within two decades, without any reference whatever to the war. It all happened before the mad dog of Europe broke loose. The year 1915 brought the reverse pretty well up to the magnitude of a disaster. The war did that; and, of course, it would have been madness under such circumstances to add to rolling stock. In 1916 gross earnings went over the top, and in 1917 created an entirely new and conspicuous peak. More earnings meant more tons, more train miles, more everything. They sent out their own S. O. S. for more motive power and for more cars: but the most insistent call for help could not be answered in 1917. The war glutton was gobbling everything in sight.

The equipment situation at this time of writing presents the following equation: With nearly 30 per cent more tonnage to be moved there are actually fewer locomotives and cars with which to move it. The answer should be, "It cannot be done." Nevertheless it is being done; but it is being done under conditions which give a pungent meaning to the term "qualified prosperity" with which the cursory review opens. It is being done under a terrific and perilous strain on every department of operation. Embargoes were almost constant throughout the long winter. The repair shops were despair shops; for the problem of keeping enough wheels on the tracks seemed at all times beyond human capacity. The situation, however, gave vital meaning to the familiar saying: "You never know what you can do until you've got to do it." Efficient co-ordination of all departments accomplished what would have been impossible on the part of any single department. All the courage of the country had not gone overseas, and there ought to be a barrel of military crosses somewhere for the men who helped out by increasing the trainload and carload, as well as for the other fellows who did wonderful things in the shops, in the car distribution offices and in every branch of the service. The railways certainly did their bit, and what they did bore its relationship to the war in only minor degree to what was being done in Flanders and France.

No Relief in Sight

Whether or not the extreme pressure will relax is a matter of sheer conjecture at this moment. During the past three months the weekly traffic returns do not show the 1917 bulge; but they are nevertheless in advance of the corresponding period. The coal situation and the priority claims of war shipments have eased up; but both suggest abundant cause for anxiety in the outlook. Experience is a stern teacher, and the railways quite naturally feel compelled to make large plans for the possible demands of next winter, plus the prospect of a larger movement of food for export. At this juncture commerce, which creates traffic, is exceedingly active and gives no indication of a let up. Taken altogether, either a prolongation of the war or the coming of peace will keep the railway offices occupied with brain-racking problems. Happily, there are big men on the job.

Within the past month effect has been given by the Railway Commission to the appeal of the railways for higher transportation rates. While the advance is nominally 15 per cent in freight and passenger tolls, the former are subject to qualifications which bring the increase down to practically 12½ per cent. For example, wheat in the West will pay but 10 per cent more, while coal between the Niagara frontier and Toronto will pay about 27 per cent more. This long-deferred concession was given in the face of determined opposition, chiefly from the West, and that opposition had really a single aspect. It was directed almost wholly against the Canadian Pacific; for the sufficient reason that the position of practically every other road was undeniably in the nature of distress. The Canadian Pacific stood out alone as an abundantly prosperous system, and there was a positive feeling against giving it higher rates. Yet the dissidents were impotent against the obvious question from the commission: "How can we help the struggling roads without at the same time increasing the earnings of the Canadian Pacific?" To meet that question there was put up to the commissioners a greater variety of impracticable suggestions than is usual in a railway rates case. As a matter of fact, no sound answer was possible. Some way had to be found of satisfying public feeling while permitting all lines to share in the increase of rates.

Special Taxes for Canadian Pacific

The way out was found in imposing special taxes on the Canadian Pacific in the following measure: One-half of its net earnings from railway operation in excess of 7 per cent on its common stock, after paying fixed charges, appropriation for pension fund and dividends on preferred stock; and income tax on the company's special income, inclusive of all its income except earnings from railway operations, under the Income War Tax Act. It is also provided that the total amount to be paid by the company each year shall not be less than (1) its net earnings in such year from railway operations, and from special income, in excess of 10 per cent of its common stock, after paying fixed charges, appropriations for pensions and dividends on preferred stock, up to $7,000,000, or (2) the amount by which its net earnings from railway operations exceed the net earnings from railway operations for the fiscal year ended December 31, 1917, due to the increase in freight and passenger rates, just allowed.

This action must be accepted as indicating the situation which has been created by the exigencies of war. Those who are gifted with a spirit of divination may see a great deal more in it than that. To say the least, we are all living in grave times.

Getting Practical Results

Turning to the activities of the Canadian Railway Association for National Defence, it may be said that a vast amount of useful, necessary and effective work has been done. This is not essentially a body created by government and operating under government control. It is rather a voluntary association, organized by the railways and having powers from within itself; yet it has the direct approval and co-operation of government, and lacks little which wholly official control could give. In some respects it is able to do what government could not very well do. Under its comprehensive name are grouped a Special Committee on War and National Defence, an Administrative Committee, a Commission on Car Service, a Committee on Passenger Transportation, a Committee on Tariffs and Statistics and a Committee on Materials and Supplies. As the work of the Association is of considerable interest to American railways a summary may be given of what has been accomplished during the recent months:

1. Great assistance has been given to shippers in the handling of freight traffic during a season of such unprecedented severity as to cause persistent hindrances.

2. The construction of freight cars in Canada was imperiled because of the inability of manufacturers to obtain materials from the southern states on account of embargoes. Arrangements were made with the regional directors of the

United States Railroad Administration whereby the acceptance of such consignments was brought about.

3. The diversion of freight has given great relief to congested lines, facilitated the movement of foodstuffs to the seaboard and saved much delay to vessels. The handling of troops was improved by the same process.

4. The net balance against Canada on freight car exchange with the United States has been decreased from 22,219 on December 15 last to 16,058.

5. The average load per car has been bettered. As compared with January of last year the carload to St. John, New Brunswick, was this year raised from 26.4 to 32.3 tons. The saving was equal to 1,313 cars, 7,300 tons of coal, and a month's time of eleven locomotives.

Snappy Bulletin

As a result of what this association has done, it is now a common thing to see a Canadian Pacific locomotive on the Grand Trunk or any other line. The bulletin which is periodically sent out contains a good deal of snappy and appealing matter, as the following excerpts will show:

"The average freight car, carrying your goods, Mr. Canadian shipper, goes only half-filled—this is a fact, government statistics show that Canadian cars are loaded to an average of only 46 per cent of their weight-carrying capacity. You may perhaps be loading a little better than that average. You may think it is 'nobody's funeral but your own,' since you pay the railways the legal rate and should be allowed to waste space if you like. But the fact is that all Canada is vitally concerned with your treatment of the freight car."

"Attention of the shipping public is directed to changes ordered by the War Board in methods of loading l. c. l. (less than carload lot) freight. The custom which prevailed until recently was to load a car for, say, 'Xboro *and points east.*' This car might contain freight even for St. B——, at the far end of that line. The shed was 'pulled' probably every day. The car for Xboro 'and points east' reached Xboro, we will say, in 24 hours. It was placed at the freight shed. The goods for Xboro were unloaded and car forwarded in possibly 24 hours after its arrival. The car proceeded then to Yville Junction. Here it lost another 24 hours in switching and unloading. This process was repeated at perhaps another point between Yville Jct. and St. B——. The car reached St. B—— in *five* days instead of two. The cargo for St. B—— in the meantime had been subjected to the usual strain of over-much shunting and switching. The car had lost three days' working time.

"The new method was put in force in December. The sheds may not be 'pulled' as often. The cars are now held long enough to obtain a full cargo for some definite point. Each car then proceeds to its destination, is unloaded at one time, and is released within 24 hours of its arrival! The time it lost waiting for a full load at the point of shipment is much less than it previously would have occupied in being switched to the freight sheds at several terminals. This economizes the time of the car, saves time for the l. c. l. shipper, and reduces the wear and tear on his shipment.

"In November, before the new system was put into general effect, 34,829 cars of l. c. l. freight were loaded at points loading five cars and upwards of such freight per day. The average weight of the contents of a car was then 11,442 lb. The change in methods brought into effect in December increased the average load per car to 12,407 lb. A gain of 965 lb. per car. There were in this month, 29,647 cars loaded at points, such as the above. Had the same average per car obtained in December as in November, 32,149 cars would have been required. Therefore 2,502 cars were saved by the better handling of the cars."

Severe Winter Hampers Railway Operation

Unprecedented Season of Storms Complicates Transportation Under Government Control

THE GOVERNMENT had scarcely assumed control of the railroads when a succession of record breaking snow storms and a protracted period of extreme cold created unprecedented operating difficulties in the larger part of the country. Most of this extreme weather was experienced in January, which was a most unusual month in many ways. Statistics recorded at Chicago show that 40.9 in. of snow, or four more inches than falls in an average winter, fell in that city in January, 1918. The mean temperature for the month was 13.3 deg. F., as compared with an average of all records in January of 23.7 deg. Only once during the month did the thermometer rise above freezing. The "snow map" of the country on the first of February showed that only a little strip of the lower Atlantic coast, Florida, the shores of the Gulf of Mexico, and a thin strip west of the Cascade mountains on the Pacific coast were free from snow. Miami, Fla., had snow for the first time on record and Houston, Tex., for the first time in 23 years; in New Orleans, La., the thermometer fell as low as 16 deg.

A Succession of Severe Storms

The first severe storm swept over the Central West and passed on east, beginning on the evening of January 5. This storm was accompanied by a snowfall of 15 in. and by a gale which at times registered a velocity of 55 miles an hour. The storm was confined to a zone within about 100 miles of Chicago and paralyzed transportation in that territory for from 24 to 48 hours. The railroads had hardly cleared the rails and yards of snow when a second storm passed through the same section of the country and swept on through the eastern states. It started on Friday evening, January 11, and while not accompanied by as heavy a snow fall—the maximum being eight inches and in many localities not exceeding three inches—it was of longer duration and driven by a gale as severe, if not worse, than that which accompanied the first storm. This second blizzard practically stopped the wheels of the railroads in the territory affected, on the 12th and 13th, but passenger service began to be resumed on something approaching normal schedules on January 14. The first break in Chicago's isolation from the East came when the Twentieth Century on the New York Central arrived at 10 a. m. January 13, a little over 24 hours late. The New York-Chicago Limited of the Baltimore & Ohio, due at 9 a. m. on the 13th, arrived at 1:30 p. m. on the 14th. The Manhattan Limited and the Mercantile Express on the Pennsylvania, due in Chicago on the afternoon of the 12th, did not reach their destination until January 14.

The two remaining storms were more severe in the East than in the West. Although a blizzard which threatened to

rival those earlier in the month struck the Central West on January 26, it practically disappeared on the following day and had no ill effects on transportation other than delaying the arrival of trains in Chicago from one to six hours and causing the annulment of a number of trains scheduled to leave that city. Farther east the storm proved far more serious in its results. The new snowfall and low temperature neutralized all the gains made by the operating departments following the previous storms. Throughout eastern territory freight traffic was generally suspended and passenger trains were many hours late. The Pennsylvania Railroad on the 28th found itself in the most difficult position in many years. Passenger trains were stalled all along the line between Philadelphia, Pa., and Pittsburgh, and even at Broad street station, Philadelphia, train movements were seriously hampered by a shortage of men to keep the switches in working order.

In Kentucky and throughout a large area tributary to the Ohio river floods and floating ice did extensive damage at this time. In eastern Kentucky a number of railroad bridges were carried away. On the Pocahontas division of the Norfolk & Western traffic was suspended because of washouts. Considerable sections of other roads in that territory were also closed to traffic for similar reasons.

The last serious storm of the winter started on February 3 and continued until February 6. Freight traffic had to be suspended on the New York Central main line west of Albany and the difficulties on the other trunk lines were almost as severe. On the morning of February 5, A. H. Smith, regional director of eastern railroads, reported that the weather was seriously impeding operations all the way from Albany, N. Y., to Elkhart, Ind. (101 miles east of Chicago). Data gathered at his office on the same day indicated a reduction of freight tonnage, because of severe weather conditions, of from 20 to 50 per cent throughout the entire eastern district. The Lake Shore Limited of the New York Central, which was due to arrive in New York on February 4, was stalled in a drift for 24 hours. Throughout New England high winds frustrated all attempts to keep tracks open, and practically all freight trains that started out were held up in snow. The snow was so hard and packed so solid that a number of serious derailments of plows, locomotives and cars further impeded operations. In northwestern New York six to eight inches of new snow had fallen by February 6, with the result that no freight trains operated in that section. In the coal regions of Pennsylvania cuts were blocked with drifts 16 to 20 ft. deep.

Emergency Measures to Remove the Snow

The heavy snowfalls and high winds and the almost incessant cold between storms made the clearing of tracks and yards a most difficult problem. Railroads throughout the territory most seriously affected withdrew large numbers of their employees from their regular work for "shovel" service when occasion demanded. In some instances the shutting down of industrial plants on account of the snow blockade made large forces of men available for work on the railroads. Some of these industries voluntarily loaned men to the carriers for snow work.

In Chicago the railways recruited a large share of their men from freight handlers, office clerks and draftsmen, many of whom could not be employed at their regular work on account of the suspension of traffic. In the East similar classes of employees were used. The Pennsylvania Railroad, which had unusual difficulties to overcome in the Allegheny mountains, drafted large numbers of shop employees for snow shoveling. Between December 20 and January 21, the men of the Altoona (Pa.) shops spent 9,225 ten-hour days in snow-shoveling and switch-clearing. On the Bellwood division, a shop force of only 259 spent 11,000 hours in shoveling snow during the same period.

The problem of removing snow and ice was one of large scope in Chicago, the country's largest railroad center. Aside from the men recruited from their own forces or loaned to them by industries, the roads had to secure additional forces from regular employment agencies, free labor agencies, or direct from the streets and lodging houses. To encourage men to offer their services for this work, arrangements were made to pay them daily, a measure which seriously complicated time-keeping and accounting. On account of the severity of the weather and the arduousness of the work it was necessary to feed the men one or more meals a day and to supply them with hot coffee at frequent intervals. Some lines were able to billet their men at nearby restaurants or boarding houses, while others ran special trains with sandwiches and coffee to the men at intervals.

The supervision of the snow removal work in the Chicago terminals constituted an administrative problem of no mean proportions. In this connection the Baltimore & Ohio Chicago Terminal improvised a most interesting organization. Men experienced in fighting snow were placed in charge of various sections of the terminals and were made responsible for the progress of the work of restoring the tracks to operation. An intelligence bureau was established in the office of the district engineer where telephone connections were available to all parts of the terminals. To facilitate this work all the telephones in this office were assembled on a single table where a staff of men received and answered calls while the information given and received was recorded on an improvised chart. By this method the needs of the men engaged in removing the snow were taken care of expeditiously.

Most of the snow was handled by shovels, although snow plows were used on the main tracks and locomotive cranes with clam-shell buckets were employed to a limited extent for excavating snow and for unloading snow from cars.

By no means all the difficulties arising during the winter were snow troubles. The freezing of coal in cars and of the lubrication in the journal boxes, frozen switches and frozen ash pans, the wear and tear on locomotives and cars because of the unyielding character of the frozen roadbed, the freezing of air hose, hot boxes due to the stripping off of journal boxes by snow and ice, broken rails, frozen signals and signal wires, the failure of interlocking plants —all these were factors contributing to the trials of the roads during the protracted period of severe weather.

In spite of the unprecedented difficulties developed during the winter, the loyal and indefatigable efforts of railroad officers and employees kept traffic moving as much as possible and enabled the government to suspend its coalless holidays several weeks before it was at first thought feasible.

The government could not have taken over the railroads at any better time to learn at first hand the difficulties of operation confronting the roads during the periods of extreme weather. Director General McAdoo, however, took a philosophic view of the situation and labored as determinedly as the operating executives under him to meet the difficulties as they arose. Preliminary reports from 172 of the 196 large roads in the country show a deficit in railway operating income for January of $2,227,000 as compared with earnings in January of last year. To the discerning observer, these figures neither prove the superiority of government operation or private ownership, but simply indicate that the railroads passed through a most unprecedented winter, one which would slow up the wheels of transportation under any form of operation.

SCRAP IRON EXPORT has been prohibited entirely by the Canadian Government with a view to conserving in Canada the limited supplies of iron and steel raw material easily convertible for manufacturing purposes. The United States prohibited export of scrap iron some time ago.

Railroads Need Large Quantities of Material

Exercise of Priority Orders Should Afford the Carriers Maintenance Supplies in Adequate Amounts

IT IS MAINTAINED BY SOME that the production of pig iron and steel ingots in this country exceeds the capacity of existing shops and factories to convert the plain materials into finished products, and further that there is no occasion for an increase in the production of the completed articles because the railroads are now taxed to the utmost in transporting the present output. Such a broad statement is, of course, subject to controversy and may be seriously questioned as applied to certain areas, but taking the country as a whole, it probably represents as nearly an accurate statement as can be hazarded on any question subject to such serious complications. If we are to assume from this that the railroads represent the crux of the situation, there can be no question but that the government, in making every effort to increase the production of war materials and domestic necessities, will see that they do not want for equipment and materials required to attain and maintain a maximum transportation capacity.

The procuring and distribution of rails to the various carriers is now definitely in the hands of the director-general. The purchasing section of the Division of Finances and Purchases under the general supervision of John Skelton Williams, will not only purchase and distribute rails, but also ties and lumber on those roads which do not traverse timber country in which they can purchase these materials locally. While rails, ties and lumber represent large items in the railroad purchases, both from the standpoint of the quantity of materials and the money value involved, there are still larger amounts of other materials which will be purchased by the railroads through their regular purchasing departments subject to the approval of the regional purchasing committees. Such purchases will no doubt also receive whatever priority ratings are necessary to insure reasonable deliveries in all cases where the supplies are necessary for the expeditious conduct of the transportation business.

Iron and Steel

The production of iron and steel in the United States has increased remarkably since the outbreak of the European war, so that the output of this country is now about 50,000,000 tons per annum, or fully one-half of the total production of the world. This represents an increase of 25 per cent in production in the past two years. However, the severe winter just past imposed such enormous obstacles, largely through the curtailment of fuel and ore supplies, that the production was seriously reduced during the winter months, particularly in January, when pig iron production aggregated only 2,403,000 tons as compared to 3,198,000 tons for November. In all there has been a set back of 1,500,000 to 2,000,000 tons at the beginning of this year, which has had a marked influence on the program outlined for the production of all finished materials in which iron or steel are used, and undoubtedly this accounts for some of the irregularities in production schedules now being experienced.

As this great industry is probably more closely allied than any other with the conduct of the war, it was the first to be considered in plans for price fixing. After three years of almost continuous advances from month to month, prices were established for pig iron, bars, plates and shapes on September 24, 1917. Other prices have been established from time to time but it was not until late in December that any items of vital concern to the railroads were affected. At that time prices were established for angle bars, track bolts and spikes, rolled steel tie plates and a number of items of scrap sold by railroads. All of the prices established are materially lower than those in effect some months previous. The President has just approved the recommendations of the price fixing committee for a reduction of $1 in the prices of basic pig iron and scrap steel, these prices and those previously established to remain in effect until July 1, 1918.

The unprecedented prices attained before they were fixed were largely caused by the keen competition between the buyers for the limited amounts of products which the manufacturers had to sell. This competition has now been virtually done away with through the institution of the priority orders, and it is in the iron and steel industry more than in any other that resort must be had to this means of securing deliveries.

Rails

The history of rail purchases by the railroads during the last four years is of unusual interest. Following the lean year of 1914 when rail orders amounted to only about 1,000,000 tons, the revival of business late in 1915 caused rail orders to increase to about 2,200,000. During 1916 the business of the steel industry grew so rapidly from month to month that it became apparent that there would be serious delays in deliveries. Many of the roads placed orders for dates much farther in advance than had ever been done before, and as a result nearly 4,000,000 tons of rails were ordered in 1916, most of the roads arranging not only for their 1917 requirements, but for their needs for the year following. In 1917 the remaining requirements for 1918 were placed, but when some of the roads attempted to place orders for rails for 1919 delivery the mills declined to take them. The result was that practically no rail orders were placed after May, 1917, and the total domestic orders during the entire year aggregated less than 1,000,000 tons.

In April, 1916, after almost 15 years of fixed prices for steel rails, the quotations were advanced from $28 and $30 per gross ton for Bessemer and open hearth rails respectively to $33 and $35. In November of that year the second raise brought the prices to $38 and $40 respectively, and these were maintained as the nominal prices all through 1917. However, these prices have meant little or nothing since early last year and the few orders that were taken from time to time during the later months were placed at considerable premiums over these nominal figures.

Since the first of the year there has been a tendency to drop the old nominal prices and higher figures are being quoted, but owing to the limited number of orders placed there is no definite price for standard rails today. Inability to buy new rails has sent the roads into the market for relayer and re-rolling rails, with the result that the prices of these have attained unusual heights.

The real problem at the present time lies not in the placing of new orders for rails, but in securing the delivery of rails ordered 12 to 18 months ago. Because of the necessity of rolling rounds for shells and structural material for ships, the mills are now rolling rails to less than one-third of normal capacity and for this reason are far behind their schedules. The rail laying season is at hand and the roads have not received their allotments. Clearly the situation is one for the Railroad Administration to handle. The subject is now under consideration, for the various roads have already been asked to report on their minimum requirements in rails

for the coming year, and presumably arrangements will be made to supply them with this most necessary material.

Structural Steel

On account of the high price of structural steel the roads have avoided the construction of new steel bridges wherever possible during the last two years. For the most part, the bridge shops have not been working to capacity, since the high prices have deterred all classes of builders or have caused them to divert their activities to forms of structures not requiring steel. There are, of course, cases where the use of structural steel has been imperative and the mills have not been so congested but that the structural shops could secure the necessary plain material. With the inception of the ship building campaign the bridge shops have been recruited in the fabrication of parts for standard steel ships, but even with this additional business the shops are not working to more than 75 per cent of capacity at the present time and new business taken in February amounted to only 55 per cent of capacity. They are therefore in a position to take any reasonable amount of domestic work offered them, provided the necessary priority orders can be obtained to secure the plain material, where prompt delivery is required. According to an opinion expressed recently by the officer of one of the large fabricating companies, the shops of the Middle West can take at least 100,000 tons of domestic construction work during the coming season.

Lumber

Like the steel industry, the lumber business has been occupied extensively with war contracts. During the first nine months of our participation in the War, the southern pine manufacturers supplied 750,000,000 ft. b. m. of lumber to the government, a large part of which was used in building the cantonments. These mills are now engaged in filling an order for 365,000,000 ft. b. m. for the wooden ship building program, and up to March 1 had delivered 240,000,000 ft. b. m. of this total. When these amounts are compared with 12,226,000,000 ft. b. m. cut in the United States in 1917, and 12,749,000,000 ft. b. m. cut in 1916, it is seen that the consumption of wood is largely affected by other influences than government requirements. It is true that owing to the large sized pieces used in ship construction, it was necessary to place prohibitions on the use for other than government work of southern pine 12 in. by 12 in. in section or larger, and of Douglas fir timber 12 in. or more on one face. These restrictions have naturally influenced the supply of posts, caps and stringers for use in railway trestles, but owing to the progress which has been made on the government work, and the movement toward the use of built-up or laminated timbers some of these restrictions on the use of large sizes have been modified.

Building work for other than government purposes has decreased materially since our entrance into the War. This has tended to reduce the use of the smaller size timbers with the result that there is a good supply of this class of material available. Lumber manufacturers and others have been more or less exercised by the movement on foot in some quarters to discourage if not prohibit all building work unnecessary for the prosecution of the war, and it is pointed out that the building operations in the United States for 1917 aggregated somewhere in the neighborhood of $3,000,000,000 worth of work, whereas government building operations during the past year amounted to only $300,000,000, or one-tenth of the total activity. Whether or not any steps are taken to restrict building operations, the present indications in the lumber market are that there will be a plentiful supply of this building material for all anticipated requirements.

As mentioned above the Railway Administration has notified the railroads that it will purchase ties for the roads in all cases where the latter are unable to secure them locally along their own lines at prices equal or less than were paid last year. This order has the effect of restricting the roads to the purchase of ties from the small producer who cuts them on his own wood lot. The production of ties during the last year has decreased materially; enlistments and the draft seem to have caused a material reduction in the number of men engaged in this industry as small producers. As a result many of the railways' the purchasers have had to go much further afield in securing their requirements than was the case in years past. There is also much doubt as to whether the railroads will be able to obtain ties at the same prices that were paid last year.

The large producer who must now deal largely with the Railroad Administration has also been hampered by a shortage of labor and a decided increase in the cost of operation through higher costs of tools and equipment and the scarcity of horses and mules with which to move the ties. In at least a few instances the tie operators have been diverted to lumbering on a small scale since it was found profitable to cut tie logs into certain small sizes of lumber.

Concrete Materials

No more favorable market for the buyer is available at the present time than that of concrete materials. Decreased building operations has curtailed the demand for these materials to a considerable extent. Production has been affected to some extent by a shortage of labor and materials and the shortage of cars needed for delivery. The latter has been the most serious problem, particularly during the winter months when embargoes were issued at different times against the use of open top cars for the handling of sand, stone and gravel. In the case of cement there is a greater argument than ever before for the use of bulk material since the high price of cotton makes the use of cement sacks much more expensive than during normal times. While subject to increases in manufacturing costs encountered in all work carried on in this country the advances in the price of cement have been moderate, and following a reduction of about 10 cents per barrel taking place last summer the price of cement has been practically stationary.

Conclusions

Purchases of supplies and materials for the railroads involving the steel market will in most cases require the use of priority orders which, because of the urgent needs of the railroads, ought to be forthcoming. As regards lumber and concrete materials the problem is largely one of the cars necessary for delivery, for the supply of these materials is adequate for any reasonable needs. The situation as regards rails and ties and to a certain extent regarding lumber is now in the hands of the Railway Administration, and involves an apportionment of the available supply, taking into account the relative needs of the railroads, the War Department and the ship building program.

AN ENGLISH RAILWAY'S WAR RELIEF SERVICE.—Of the staff of the Great Eastern Railway 8,800, or 25 per cent, have joined the colors, of whom 671 have been killed and 470 have been discharged and have re-entered the company's service. At the annual meeting of the company the chairman said that much useful work had been done in assisting those who had been discharged from the army to obtain their proper pensions and gratuities, and what was, perhaps, more important still, no dependents of those who are serving with the colors are allowed to get out of touch with the railway. The services of the company's war relief committee were always freely at the disposal of the dependents in any troubles and difficulties which arose, and in regard to which, in the ordinary way, they would depend on their husbands and relatives.

Improve the Equipment of the Railway Shops

Earning Power of Modern Locomotives Is Limited Greatly by the Lack of Repair Facilities

By H. L. Burrhus

"YES, we do need a new planer, and, if we could get one, we would save our company more than $10 a day in machine work alone," said a machine shop foreman on a busy Eastern road.

"Why don't you speak to your master mechanic about your conditions and have him make a requisition for a new machine?" he was asked.

"I have done so already, but the machine tool builders are so tied up with Government work, they wouldn't even listen to a request from our railroad for a new tool," replied the machine shop foreman.

"You are entirely mistaken about the delivery conditions of the machine tool builders, as many of the largest companies are prepared right now to make deliveries in from 60 days to seven months of such standard tools as planers, lathes, shapers, slotters, drill presses, etc.," he was told.

"Well, granting that the machine tool builders might be able to build us a machine, the 'old man' (meaning the master mechanic) wouldn't take any action right now, for you know we are under government control, and he is not just sure where we stand," continued the foreman.

"To answer this objection," replied the questioner, "let me ask you to imagine that you own a house and lot. You want to sell, but just because you expect to get the property off your hands soon, will you stand idly by while the house goes to ruin, or will you make such improvements as will tend to increase the value of that property? Bringing the argument back to our subject, don't you believe that a railroad property whose equipment is modern and kept up in good shape will bring a better return than a property that is far inadequate for its needs? Irrespective of whether or not you expect to soon turn your property over to the government, you should not leave any stone unturned to bring your shop up to the most efficient and economical condition."

"Well, so far you have gotten the best of the argument," answered the foreman, "but here is one objection you cannot get around. Everything is so high right now that it would be madness to purchase any machine tools at their present high prices. We have gotten along so far without the planer, and, until machine tool prices come down to a reasonable figure, I would not like to be the one responsible for making requests for new machine tool equipment."

Easy to Answer

"That was the first objection I expected you to make, and it is the easiest one for me to answer," was the quick reply. "While it is admitted that machine tool prices have advanced considerably, have you overlooked the fact that your own labor has also advanced in cost—in many cases proportionately more than the advance in machine tools? Where you formerly could figure an approximate saving of 20 per cent on the investment of a new machine tool, you are now able to easily show this saving to be from 25 per cent to 30 per cent under the new prices, because of the many wage increases you have granted your workmen. And here is another item you have overlooked—the value of a locomotive service day now, as compared with a service day several years ago.

"Today the locomotives are so much larger that, when idle, a large sum of invested money is tied up. There was a time when an idle locomotive represented only about 25 or 30 cars, but today one of our modern engines is capable of hauling 100 cars. So, you see, an engine waiting for repairs also means 100 cars standing still, while, in turn, perhaps affects the working of some big factory which is depending on that freight. You have admitted there are several jobs which require two days to machine with your present equipment, while with modern equipment you could turn the work out of your department in five hours, thus giving your company the services of a high-power locomotive for one and one-half days which is now unnecessarily lost. How many of these additional service days do you think it would take to buy one or two modern machines?"

This is a typical conditon on many railroads today, for the maintaining of power is the keynote of successful transportation. New locomotives will not altogether solve the problem, as in a short time even new locomotives will require attention, and unless proper facilities are provided, the cost of upkeep and the revenue loss of locomotives out of service will be excessively high.

There is a big opportunity right now for the purchase of machine tools. Whether the railroads will look the issue squarely in the face and take immediate steps to protect their interests is a question. While there are many large modern up-to-date shops and terminals, it is a fact that the majority of shops and terminals are small and inadequately equipped. This has never been so well illustrated as during the past winter. On some roads the roundhouses were so small that it was impossible to get the engines in the house and shut the doors. This meant that the locomotives had to stand outside, where it was impossible for the workmen to give them proper attention, and where it was a very easy matter to freeze up. Even where the engines were pushed partly into the roundhouse, working conditions were such that the locomotives soon showed what attention they received by their performance on the divisions.

Inadequate Machine Tool Equipment

And just as true as these roundhouse conditions is that of the machine tool equipment. Machine tools were old or in many cases the size of the jobs has far outgrown their capacities. Yet the railroads hesitate to purchase. The requests made by the machine shop foreman—the fellows on the job—are side-tracked on one excuse or another and no attention or thought given to the steady daily loss from this department.

Many railroads—in fact, all railroads—keep accurate records of coal consumption, lubrication and many other items of daily use, yet overlook the one big item of machine shop output. We are all guilty of looking upon the machine shop foreman as a "kicker" or upon a machine tool salesman as a person who is simply trying to get our money. Yet the machine tool salesman is many times the good Samaritan in disguise.

The recommendations and purchase of machine tools on the railroads should be handled and should receive the same attention as in privately owned factories. How often we pick up a magazine and read of some factory that has installed a modern machine to speed up its output or to produce mechanically a job that was formerly done by hand, but where, due to the shortage of help, it was necessary to install a machine. Then compare these conditions by visit-

ing a railroad shop in almost any part of the country and notice three or four husky men pounding a piece of iron into shape in the blacksmith shop, where a power operated hammer would do the trick in much less time; notice boilermakers driving rivets by hand or putting in staybolts by hand—all jobs of frequent occurrence and which can be handled much quicker and better by power tools; and in the machine department there are so many comparisons it is a hard matter to select any one.

However, let us look at just this one case. During one of the cold spells this past winter, when engines were so scarce, a big, high-power locomotive reached a certain roundhouse at seven o'clock in the morning with a loose piston head. Outside of this one job the engine could have been turned and despatched by nine o'clock, but it was necessary to make a new piston head. By eight o'clock the machine department had started to machine the new head, but due to antiquated machine equipment, the new head was not completed and ready for application until after seven o'clock that night, with the result that it was necessary to work men at overtime rates to complete the job, besides unnecessarily holding an engine which could have been earning money. All this delay and increased costs were directly traceable to inefficient machine tool equipment, for a modern machine could have completed that head in five hours less time, which would have saved the overtime rates paid the workmen and would also have given these five hours to the locomotive for revenue service, instead of a dead loss standing in the roundhouse.

The necessity of machine tool purchases is obvious, and the only question is whether the railroads will take steps to build up their equipment or whether they will allow conditions to exist as at present and then, over night, try to make all the corrections at once.

We are just emerging from a hard winter, and with our past experiences fresh in mind, now is the logical time not only to lay plans to prevent a recurrence, but also to take immediate action. It is so easy to offer the old excuse that roads have gotten along so far without making purchases, and they can still get along. But every day's delay means that much more loss and confusion eventually.

Not an Unusual Case

As conclusive proof of the fallacy of new equipment solving transportation problems altogether, let us look at the results on one road which secured 50 new heavy type locomotives, but paid no attention to providing proper housing or machine tool equipment to keep these engines in repair. For a time there was no shortage of power, but eventually one could find locomotives in the roundhouse tied up for poor tire flanges, but no machine on hand to turn the tires. Or it was a broken guide bar, or side rod or driving box; however, there was no machine tool equipment to make emergency repairs, and the engines had to wait that much longer while these parts were made up at some other shop and shipped in by way of the congested freight route, in one specific case taking over two weeks for a repair part to be received.

As to just what tools are required for immediate use it is hard to make up a satisfactory list. Planers, shapers, lathes, drill presses, etc., are in many cases so old and unfit for use that it would appear as if some shops ought to put in a complete new equipment. Then again it is not necessary to purchase new tools altogether, for the roads are, in some rare cases, in a position to help themselves upon the introduction of heavy power, as proven by one road. In this case it was found that there was not a lathe on the road with a bed of sufficient length to enable the turning of extended piston rods used on the new locomotives. This matter was easily taken care of by making and applying extensions on one lathe at each terminal. On another road, after it had been decided to apply cylinder bushings in all cylinders, it was found that there was not a lathe of sufficient swing to permit the turning of the bushing to fit the cylinders. In this case the raising of the head and tailstock on filler blocks was a very unsatisfactory arrangement, for the lathes so equipped were not rigged enough to do efficient work, and every bushing turned really cost three times as much as it should.

Poor Tools Cause Waste of Fuel

Another road made a big campaign on coal saving, but lost sight entirely of its greatest waste. In this case, the equipment for machining piston heads was very poor, and piston heads were changed only as a last resort, which meant that the amount of steam wasted by small heads really amounted to a big waste in the coal pile and in the efficiency of the engines.

As before stated, the comparatively few large modern shops are quite well equipped with modern machinery, but the innumerable medium sized shops and roundhouses are, as a rule, very much in need of new machine tools. To keep down the percentage of power under repairs for more than 12 hours means quick and accurate machine work. To purchase needed tools for this will require the investment of a large sum of money, but there is no investment more profitable right now for any railroad than to put in new machine tool equipment.

The effect on the workmen is important, for good workmen often get disgusted and quit because of poor machine equipment. A good workman has pride in his work and his ability to produce, but when you tie his hands by giving him a machine to run that was built before the Civil War, he will soon throw up the sponge and leave.

The Value of Good Tools

In conclusion let us quote the stand taken by one successful master mechanic who realizes the value of good machine tool equipment. He said: "We speak of the work of a locomotive in terms of horsepower, yet some people abuse their power worse than they would a horse. They let their engines stand outdoors in all kinds of weather and feed them sawdust, yet expect a full horse-power return. Now, common sense tells us that no horse would stand these conditions, so why expect it from a locomotive? I want my locomotives under cover and fed with the best materials possible, together with good workmanship. To get good workmanship, you must have good tools, and I have been here 23 years, and so far have not been refused a single item I have put on my requisition. And as to my costs, you can see we have the best of everything; our shop is modern and our power up in A-No. 1 condition, yet my cost per locomotive-mile is not more than, or is lower than, that of neighboring roads. When we start a locomotive from the roundhouse, we know it will give perfect service, for we give it good attention. I figure our success is due to good materials, good machine tool equipment and good workmanship."

It might be well to draw attention to the fact that right now is the logical time to place machine tool requisitions because of the valuation work which is being so extensively carried on. This work has developed some interesting data as to the age of various machine tool installations, and officials who have occasion to check up the findings of their various valuation committees will be astonished to learn how antiquated and inefficient their machine tool installations are. Brought face to face with the facts that shops are trying efficiently and economically to maintain modern power with machinery that is 30, 40 or 50 years old is sufficient reason for the immediate purchase of modern machine tools. It may be a question of borrowing money to make purchases, but money cannot be expended to any better advantage than to protect efficient and economical locomotive service with efficient and economical machine tools.

The Assistance Available for the Exporter

A Government Bureau, Export Associations, Commission Houses and Banks All Want to Help Him

WHEN ONCE THE RAILWAY SUPPLY MANUFACTURER has been converted to the idea of export trade the first question he will ask himself is "What steps should I take to secure and maintain an export business?"

The agencies that stand prepared to help the exporter, experienced or new to the export field, are legion. There is the government's very efficient Bureau of Foreign and Domestic Commerce. There are several export associations such as the American Manufacturers' Export Association, as well as a number of other bodies such as the National Association of Manufacturers, or the Philadelphia Commercial Museum which have extensive export departments.

There are likewise a large number of export or commission houses many of them with very extensive financial backing which are prepared to advise the manufacturer or practically handle for him his export business in a particular country or perhaps throughout the world.

The banks also have been leaders in American export activities. A number of them, as will be noted later, have built up important export service departments and are in a position to advise and to extend the financial credit necessary.

And last, but not least, there are today in this country several purchasing commissions whose offices have been buying war necessities for their governments, or who are keeping in touch with the American market with a view to making large purchases here as soon as material and shipping space can be secured.

One export authority stated to a *Railway Age* representative that there were three ways in which an American manufacturer unacquainted with export trade might go about establishing a foreign trade.

First, and for many manufacturers best, he said, the manufacturer should go himself or send a competent man to the countries he wishes to do business with. This representative should investigate and study conditions, possibly try to secure orders and establish agencies.

Second, if the manufacturer cannot send a competent representative he can efficiently build up a foreign trade through a good commission house or reliable export firm. In such case, of course, he should deal only with well-known houses. Most of them have offices in New York. They know their markets thoroughly and if treated generously will build up an export trade for the manufacturer, handling his missionary work, the placing of the orders, the shipments and the financing.

The third way to build up an export trade is by advertising and circular matter. This method is slower but will achieve results. It is usually advisable to start an export business through circular matter and advertising so that when representatives are sent out they will have less missionary work to do.

Bureau of Foreign Commerce

Railway supply manufacturers have not begun to realize the services that are available to them practically free of cost through the Bureau of Foreign and Domestic Commerce. The Bureau is doing a big work and with the present growing interest in export trade its value to American industry will be better understood and its services utilized to a greater extent.

Burwell S. Cutler, chief of the Bureau, made the statement at a meeting in Boston last week that as a trade promoting agency the bureau was equal, if not superior, to the corresponding organizations in foreign governments, the truth of which statement, he added, has been conceded by foreign officials themselves. Those railway supply manufacturers who have seen Frank Rhea's report on markets for American railway materials in Australia and New Zealand, or the abstract of his conclusions in a recent issue of the *Railway Age,* have come to realize the value of the Bureau and will bear out Mr. Cutler's remarks.

The Bureau of Foreign and Domestic Commerce is charged by law with the duty of "developing the various manufacturing industries of the United States and markets for their products at home and abroad, by gathering and publishing useful information, or by any other available method."

The bureau is a clearing house for commercial information of all kinds, and has a well-organized and efficient system for its collection and distribution.

Consular Service

There are three principal sources through which the bureau secures foreign trade information—through the consular service, through commercial agents and through commercial attachés.

The United States Government maintains abroad nearly 300 consular offices and in addition many agencies. These consular officers furnish the bureau a great fund of information relating to the trade of their districts, including annual reviews of commerce, special reports called for by the Department of Commerce, lists of importers, notices of bids for contract work, requests of merchants to be placed in communication with American exporters, etc.

Commercial Agents

Most of the commercial agents are taken from active work in some particular industry or some special branch of commerce and are experts in their respective lines. They travel widely and make reports as to methods of manufacture and special requirements in the lines that they are investigating.

Commercial Attachés

While stationed at one post like the consular officer, the commercial attaché is free to travel within the field to which he is assigned. He has but one function—the facilitation of commerce between the United States and the country to which he is assigned. Each attaché speaks the language of the country in which he is located and is thoroughly conversant with its commercial usages.

In addition, the bureau receives numerous official and other publications from foreign countries, which are utilized in answering requests for information. It also avails itself of trade journals published in this country and of the assistance of commercial organizations.

But the method of making this information available is as important as its gathering. Most important of the publications of the bureau is the daily Commerce Reports.

These contain articles submitted by consular officers and commercial agents of the Department of Commerce and trade information through other sources. It is the organ through which current information on foreign trade matters is distributed to American business men. It is sold by the superintendent of documents, Government Printing Office, Washington, D. C., for $2.50 per year. (Subscriptions will also be received at the district offices.) The annual reports of consular officers, formerly published in this daily journal are now issued as supplements to it and are mailed to all subscribers to Commerce Reports.

Daily Commerce Reports

Not the least important section in Commerce Reports is the trade opportunity service. Announcements of specific opportunities for the sale of American goods abroad are published in Commerce Reports. The names and addresses of the foreign importers desiring the goods are not given in these announcements, but are furnished to bona fide American firms upon application to the bureau at Washington, or to any of the district offices.

In applying for such names and addresses the inquirer need refer only to the number of the announcement as published in the Daily. A separate application on the firm's letterhead should be made for each "opportunity" desired.

When the confidential information furnished regarding an opportunity for sales in foreign countries is too detailed to be given in a "trade opportunity" announcement, it is embodied in a confidential bulletin or circular, which is sent to firms that are listed in the trade index files maintained by the bureau and its district offices.

There are also many other publications of the bureau but those of most interest to railway supply men are the special bulletins, of which Frank Rhea's report on railway supplies in Australia is typical. These bulletins are issued from time to time on all kinds of commodities, but it is of great interest to railway supply men to know that in addition to Mr. Rhea's first report, another will soon follow on markets for American railway materials, equipment and supplies in China and Japan.

Use the Bureau

No railway supply man who is going after foreign trade can neglect the opportunities offered him by the Bureau of Foreign and Domestic Commerce. As Mr. Cutler says:

"Exporters should learn to utilize more fully the economic laboratory which the bureau has built up during the last six years. If used continuously, the public will acquire habits of scientific precision, which will prove a surer means to successful foreign trade than any other. It isn't enough to be satisfied with casual applications for data from the bureau. Requests for information should automatically renew themselves, so that the exporter is currently informed on the slightest change which affects his business abroad. If German efficiency comes from any one thing, it is just that habit of laboratory thoroughness.

"You may look upon your Bureau of Foreign and Domestic Commerce as the headquarters for American business. Our success will be proportionate only to the use which you make of us, and I may state confidently that the Department of Commerce will receive from Congress funds and authority to exercise its functions up to the limit of your requirements so long as you let them be known with the positive voice of people who have the right to command us."

The Philadelphia Commercial Museum

The Philadelphia Commercial Museum is more or less typical of a number of large and efficient agencies assisting in foreign trade, including the Pan-American Union at Washington which has proved itself of particular service to exporters to South and Central America; the National Association of Manufacturers, the American Manufacturers' Export Association, and to a lesser degree, the Chicago Association of Commerce, the Business Men's League of St. Louis, etc.

The Commercial Museum's efforts in foreign trade are centered in its foreign trade bureau. This bureau publishes a foreign trade paper, Commercial America, a Spanish edition of which is sent to South America. In addition it supplies the following services to its members:

Compiles lists of established business houses in foreign countries.

Translates business correspondence.

Publishes a weekly export bulletin, containing inquiries from foreign firms, general export news, changes in tariff, trade mark and patent laws, travelers' regulations, business suggestions and trade openings, a schedule of steamship sailings for the month, etc.

Offers assistance in securing selling representatives in foreign countries.

Replies to inquiries about foreign firms.

Answers special commercial inquiries for information covering such subjects as consular invoices, regulations, duties, and more general matters such as the character and possibilities of particular markets and the development of business in any foreign country.

Circulates among foreign buyers typewritten and printed lists of members, etc.

Assists in the collection of accounts.

National Foreign Trade Council

The National Foreign Trade Council will hold its fourth annual convention in Cincinnati, April 18 to 20. At this convention there will be brought together the leaders in thought in the foreign trade activities of the nation and questions will be brought up of vital interest to the manufacturer or exporter. A considerable number of supply men are planning to attend the meeting, and they may later obtain a copy of the proceedings of the meeting from the secretary, L. K. Davis, 1 Hanover square, New York.

The Commission Houses

It is through the commission house or export firm that most manufacturers of railway supplies will probably find it most advisable to carry on their direct export activities. As would naturally have been expected from our vastly increased export trade of late, the commission houses have seen a tremendous development within the last two or three years. New companies have been organized and have attained an enormous growth in a space of only a few months.

The commission houses and export firms are of many kinds and carry on their businesses in different ways. Some with powerful financial backing are able to conduct a combined import and export business in all kinds of commodities with almost the entire world for their bailiwick, combining in many cases with their extensive corps of foreign

representatives, a financial or even a shipping service that proves of great advantage to their clients. Other export firms specialize on particular countries or markets and offer to the exporter the services of a trained corps of experts with special knowledge of markets and conditions in their special fields. There are further a number of companies that specialize in certain commodities such as steel or railway supplies, having the advantage of a corps of engineers versed not only in the conditions in their markets but with a detailed knowledge of the steel or railway supply industry. The manufacturer of a particular commodity may find it to his advantage to tie up with one or with another kind of export houses, depending upon the market he desires to cultivate, his product or his organization. Many manufacturers who have a well organized export department of their own and with representatives abroad often find it to their advantage to secure also the assistance available through an export firm.

Typical, more or less, of a considerable number of the export houses that are in a position to be of service to the railway supply manufacturer are three export organizations connected with the American International Corporation.

American International Corporation

This corporation was organized in 1915 to develop international trade, American enterprises—both domestic and foreign—and to promote organizations of mutual advantage to American bankers, business men and engineers.

Among the important undertakings since its organization the corporation has formed several exporting companies, of which three are of particular interest to the manufacturer of railway material and supplies. The Allied Machinery Company of America was organized to export machine tools; the Allied Construction Machinery Corporation to export construction machinery; and the American International Steel Corporation to export iron and steel, and iron and steel products—including locomotives, cars, and railway supplies.

These three companies have formed large foreign distributing organizations which include executives, salesmen, and demonstrators of ability. Offices have been opened in the principal markets of Europe, and the companies are extending eventually to cover every important market of the world.

One of the interesting features of these organizations is their affiliation with the American International Corporation. This connection is necessarily of distinct advantage because of that corporation's world-wide activities in financing, managing, trading, and construction and engineering work.

Like other exporting companies, they render such service to the manufacturer of American products as the assumption of exchange liabilities, insurance risks, and the negotiations for shipping space, as well as making shipping collections and obtaining the export licenses necessary under the present national emergency. They are also in a position to extend credits to customers abroad.

With a view to showing even more definitely what the export firm can do to help the railway supply manufacturer obtain and conduct his export trade, the *Railway Age* reproduces on another page an article on "How the Export Houses Help in Foreign Trade."

The Export Services of the Banks

They say that trade follows the flag—they ought to add also that it follows the banking facilities. When one realizes how far reaching are the plans now being made to further export business by some of America's leading banking houses, he begins to see in a clearer light how favorably the bankers and the progressive business men in general of this nation look on foreign trade. It has been generally conceded that England, Germany, France and Japan had as one of their best weapons in foreign trade their efficient foreign banking systems and the means for financing long term credits. The American bankers today are fast putting themselves in as favorable a position in foreign trade as the banks in Europe and the interest that is being manifested by them in this matter augurs well for our future position in export trade.

The expansion "foreignwards" of American banking has accompanied an increase in our foreign commerce, including both imports and exports, from $3,902,900,051 in 1914 to the huge total of $9,183,712,931 in 1917, an increase that in three short years has made us the greatest exporting nation in the world. One cannot yet say that American bankers the country over have taken the keen interest in export trade that should be commensurate with this expansion but such powerful financial houses can be named as the National Bank of Commerce in New York, the National City Bank and its affiliate the International Banking Corporation, the Guaranty Trust Company, New York; the Irving National Bank of New York, the Chase National Bank of New York, the Mercantile Bank of the Americas, the American Foreign Banking Corporation, the National Shawmut Bank of Boston, the First National Bank of Boston, the Hibernia Bank & Trust Company of New Orleans, the recently organized Foreign Trade Banking Corporation, etc.

These banks are leaving no stone unturned to emphasize to their clients the advantages of foreign trade; they have established foreign trade service departments to advise and assist their customers and they stand ready with the capital to arm the exporter who goes forth in quest of foreign business.

What can these banks do to assist the exporter?

National Bank of Commerce

"The National Bank of Commerce in New York," said an officer of that bank, "established its foreign department many years ago. During the course of years connections have been established with practically all the leading banks throughout the world, many of them government institutions. By adopting the policy of establishing connections with the leading banks of the various countries, the bank's clients receive service in the form of close co-operation with large local banks that are thoroughly conversant with local conditions.

"Until the outbreak of the war in August, 1914, London was the financial center of the world for exporters and importers. The war caused a disastrous disruption in foreign trade, with heavy fluctuations in all foreign exchanges. The American dollar was practically the only stable medium of exchange. The dollar letter of credit was created and gradually a dollar exchange market developed throughout the world. The National Bank of Commerce in New York has played a large part in the establishment of dollar exchange. Its foreign department has been developed with a view to the offering of personal service of all kinds both to importers and exporters. It is prepared to suggest new markets to exporters and to provide adequate facilities for the development of such markets. It obtains from its foreign affiliations lists of reliable merchants for firms among its customers who have not deemed it advisable to send a representative abroad. It secures information regarding their

prospective customers, suggests the terms under which shipments should be made, assists in the details of actual shipment and forwards and collects their drafts through its foreign correspondents.

"The relations with correspondents abroad permit the bank to offer to its customers a wide range of facilities, among which may be enumerated the transfer of funds abroad by cable or check, purchase and sale of securities, negotiations of drafts or checks on foreign banks, firms or individuals, etc. A method which the foreign department of the National Bank of Commerce in New York has developed with especial success is that by which the foreign importer instructs his bank to open letters of credit through its New York correspondent in favor of the American exporter. The latter presents his documents and payment of the amount prescribed in the credit is made to him. In making these payments an attitude as liberal as possible, consistent with interests of the bank's foreign correspondents under whose instruction it acts, has been adopted. To the traveller overseas the National Bank of Commerce in New York offers travelers' checks which may be exchanged for local currency in all foreign countries, or travelers' letters of credit, which can be cashed at the many offices of the various correspondents throughout the world. If he is a commercial traveler the bank can furnish him with letters of introduction to the leading correspondents in the cities he intends to visit, can make arrangements with the correspondents to put him in touch with the leading merchants in his line, and furnish him with credit reports regarding his prospective customers."

National City Bank

The National City Bank has done more in foreign branch banks than most of the other banks. It now has branches which do a regular deposit banking business in 13 foreign cities and its affiliated institution, the International Banking Corporation, does what is better known as exchange banking in something like 18 cities, principally situated in the Far East. The branches of the National City Bank are located at Havana; Santiago de Cuba; Caracas, Venezuela; Bahia, Rio de Janeiro, Sao Paulo, and Santos, Brazil; Montevideo, Paraguay; Buenos Aires, Argentina; Valparaiso, Chile; Genoa, Italy, and Petrograd and Moscow, Russia. It also has representatives in London, Copenhagen and Milan. The International Banking Corporation, in addition to its offices in New York and San Francisco, has four branches in the West Indies, and at Panama and Colon in the Canal Zone; Medellin, Colombia; Bombay and Calcutta, India; Singapore, Borneo; Batavia, Java; Manila and Cebu in the Philippine Islands; Kobe and Yokohoma in Japan; and Peking, Tientsin, Shanghai, Hankow, Canton and Hongkong in China.

When asked to explain what services the National City Bank could render to an exporter of railway supplies, a representative of the bank's foreign trade division said:

"The National City Bank of New York is ready to be of service to manufacturers of railway material and equipment, and to engineering and construction enterprises, in handling foreign business and contracts. The bank's foreign branches are in close business touch with foreign interests where they are located.

"The bank is able, after conference with manufacturers here, in order to have a comprehensive enough grasp of the details of their production, plans and policies to enable our managers and commercial representatives abroad to discuss the affair intelligently, to obtain preliminary information for them, and get them in touch with foreign possibilities.

"Any large financing that would be required for increase of manufacturing, or long-term credit arrangements in the case of large foreign contracts or semi-public works, would be matters for special negotiations, as every manufacturer knows. The commercial financing of the business would be easily handled in the foreign division of The National City Bank of New York. The bank's organization is so extensive, handling the immense volume of foreign business as it does, that it has special machinery ready for the many variations of foreign business conditions, extraordinary or accidental, that have in the past made the handling of foreign business settlements through banks that were not equipped for it the occasion of American manufacturers' keeping away from export and import business. The bank has direct sources of credit information. It handles all foreign business either completely through its own organization, with the obvious advantages of safety, secrecy and care, or through its direct correspondents.

"The National City Bank of New York commands the facilities for the most economical financing of sound foreign business transactions, no matter how big. Based, of course, upon negotiations by which manufacturers would establish their credit, the bank is able to arrange the financing of shipments on terms to fit the conditions of the business, whether by loans, discounting of individual bills, or refinancing by means of acceptances, according to the circumstances of the individual manufacturer's affairs and the transactions concerned. In business as extensive as that of selling railway materials, equipment, or construction abroad, the organization represented in the foreign division of the National City Bank of New York would probably be of more than ordinary assistance, since the bank is in a position to open foreign deposit accounts for the receipt of foreign payments, thus avoiding the cost and uncertainty of many exchange transactions. In other words, through the National City Bank of New York's world-wide banking organization, such big exportation as is involved in foreign business in railway materials would be carried on with the banking transactions hardly more intricate than in the case of extensive business inside the United States."

Foreign Trade Banks

A bank that is organized to take charge of a manufacturer's foreign trade and handle it entirely without assistance from the manufacturer is a new development for America, but is an old idea to many business men in foreign countries. The foreign trade banks of Germany are credited with being one of the most active agencies in securing the great volume of export business that that country enjoyed before the war.

Such a bank is the Mercantile Bank of the Americas organized about two years ago and now having headquarters at 38 Pine street, New York, with branches all over the world. The American Foreign Banking Corporation of 56 Wall street, is another trade bank that was organized recently and the Canadians have also formed at least one bank of this kind.

The secret of the strength of the trade bank is that it has a world-wide organization with branches and agencies in all parts of the world. The men in these branches and agencies are seasoned business men and capable of undertaking almost any kind of business transaction in the interest of the clients of the bank. They make reports of all kinds, ranging from the financial standing of a single foreign dealer to the trend of business in a whole country or the state of a given industry, and can give expert advice on the prospects of success for a projected foreign railroad, etc. This service is maintained for the benefit of the clients of the bank and in addition the client has the opportunity of consulting the staff of the bank at the American headquarters. The home staff includes an adequate number of men who have had extensive experience in doing export business and who are well acquainted with conditions in foreign countries. A little of the time of such men is worth a great deal to the manufacturer who is trying to organize an export branch to his business. In fact concerns with years of experience in dealing

with foreign markets do not hesitate to consult the foreign trade banks when in need of information.

Mercantile Bank of the Americas

The Mercantile Bank of the Americas was organized by Brown Bros. & Co., J. W. Seligman & Co., and the Guaranty Trust Company of New York and is closely connected with the National Shawmut Bank of Boston, the Anglo London, Paris National Bank of San Francisco and the Hibernia Bank & Trust Company of New Orleans.

In reply to a question as to what service the bank offered to the exporter, Mr. Van Deusan of the bank said:

"We have organized especially to finance export orders. Where the foreign customer wants long credits we will finance the transaction. We give the American manufacturer cash as soon as the goods are shipped and the customer has accepted the shipment. This is done by cable so that the manufacturer is paid almost immediately after shipping his goods. This is called financing acceptances.

"If a manufacturer with an attractive export proposition does not want to go after export business we will do it for him. All he needs to do is make his product, pack it, as we direct him, address it and load it onto a freight car at his factory.

"When a manufacturer wants to develop an export business, but does not know how to go about it, we will show him. We are creating branches and connections in all countries in order to give a complete service to clients. We will help a manufacturer find customers, establish his connections, tell him where his market is, and make up for his deficiencies as an exporter in any respect.

"We have one branch in Paris and in Barcelona; one branch in Lima, Peru, and ten agents in other Peruvian cities; one branch in Ecuador and agents in six cities of Ecuador; seven agents in Colombia; four banking connections in Chile, Venezuela, Costa Rica, Salvador, Guatemala and Honduras; one branch in Brazil and close banking connections in Bolivia. Other branches and agencies will be established as rapidly as there is need for them."

American Foreign Banking Corporation

The American Foreign Banking Corporation was organized for the same purposes as the Mercantile Bank of the Americas. The directors of the American Foreign Banking Corporation are the presidents of the following; Chase National Bank, New York; Trust Company of Cuba, Havana; Essex County National Bank, Newark; Corn Exchange National Bank, Chicago; Fifth-Third National Bank of Cincinnati; Canal Bank & Trust Company, New Orleans; First & Security National Bank, Minneapolis; National Bank of Commerce, St. Louis; Philadelphia National Bank; First National Bank of Cleveland; Merchants' National Bank, Boston; First National Bank, Milwaukee; Merchants-Mechanics First National Bank of Baltimore.

The Foreign Trade Banking Corporation is a very recent development, the announcement of its organization having been made only a week ago. The bank is a discount bank and the first of the kind to be organized in the United States. Its president is George A. Gaston, head of Gaston, Williams & Wigmore, Inc., and its managing director is Max May, until recently vice-president and manager of the foreign exchange department of the Guaranty Trust Company.

Foreign Trade Banking Corporation

In stating the purpose of the bank the announcement said:

"The company will be operated along the same lines as similar institutions have been conducted for years in England and France and which have done so much toward building up the large and profitable overseas patronage of those countries prior to the war. Comparatively little was known of trade acceptance in this country before the war, but during the last two or three years its importance and value in international business relations have become widely recognized, and it is now one of the most popular and helpful financial instruments. On the surface it appears strange that a banking institution of this kind has not been organized in this country earlier. There are a considerable number of them operating in London, and in addition to being highly profitable to their owners they have proved of great assistance to all parties concerned—the buyer and seller, as well as regular banking institutions, through creating a larger volume of remunerative business for them."

George A. Gaston, the president, said in commenting on the new bank: "We hear much these days about rendering service for the purpose of fixing up and holding our foreign patronage. Most of this propaganda consists of statements relative to proper packing and other features—important, but matters of detail. Of greatest importance is the matter of credit to help us achieve this most desirable result. What this country needs to maintain its recently won supremacy as an exporter is adequate shipping facilities and a more elastic credit system. It appears now that in the future we will have less trouble about overseas shipping, so the matter resolves itself more or less down to one of credits and proper or beneficial financing. The new discount company will not accept deposits like banks, nor transact a general banking business. In other words, it will not compete in any way with the established banking institutions. Naturally enough a great amount of educational work must be done among the banking institutions generally throughout the country, so they will understand fully the value of trade acceptances. Such knowledge will enable them to render a real and constructive service to their own patrons.

"Beyond dispute the establishment of the Federal Reserve Bank was the most progressive step taken by this country in many years. It has proved a great boon to the industrial and commercial life of the country, and while it gives needed elasticity to the country's banking capacity through its discounts of commercial paper, it maintains direct relations only with banks. Our rediscount bank will offer rediscount facilities to banks, and will go even a step further by extending service to firms and individuals."

The Visiting Purchasing Commissions

So many railway supply men are already familiar with the foreign railroad purchasing commissions that are now in this country that but a few words concerning them will suffice.

The commissions have been here not only to place orders for much needed railway supplies for their country's railroads, but to inspect the material ordered, to assist and superintend its shipping and in some cases to keep in touch with the market here with a view to placing orders for requirements after the war. The personnel of the commissions consists as a rule of important railway government officials.

The Japanese Commission has been in New York with headquarters at 17 Madison avenue. Akio Kasama, secretary of the Imperial Government Railways who has been in charge since Dr. Shima left for Japan last December is, however, also about to leave for Japan.

Captain Raymond Michel, a distinguished French officer, is in charge of the railroad department of the French High Commission.

The purchasing board of the railroads of Italy is headed

by V. Pizzorno, president of the Italian State Railways' Commission of Inspection at 291 Broadway, New York. A. Palanca, at 291 Broadway, is head of the Italian Ministry of Shipping. General Tozzi of the Italian Military Commission in the Metropolitan building, New York, is also interested in the buying of railway supplies.

Russia

The Russian Mission of Ways of Communications has offices in New York and in Washington, D. C. It consists of Professor G. Lomonossoff, Count S. I. Shulenberg, Alphonse I. Lipetz, and M. N. Groten. Professor Lomonossoff is president of the commission with headquarters in New York. He is a member of the council of engineers of the Russian Ministry of Ways of Communications in Petrograd. Mr. Lipetz, head of the locomotive department of the Russian Mission and formerly an important officer of the Russian Government Railways is responsible for the design of the Russian Decapod locomotive built in this country as described in the *Railway Age Gazette* of October 12, 1917. Mr. Groten is chief of the car department of the Russian Mission of Ways of Communication and is responsible for the design of the Russian railroad cars built in this country. The mission has a large staff of engineers and inspectors who have been in charge of the construction in this country.

Netherlands

The government of the Netherlands has a purchasing office for the East Indian possessions in the Whitehall building, New York. This office has been purchasing railway supplies which have been shipped from Pacific Coast ports. As an indication of what the future policy of the Hollanders will be in regard to the purchase of railway supplies in this country a member of this commission said:

"After the war Holland will make every effort to continue to buy supplies in the United States. They will do this regardless of the price of supplies, because it is not desirable for Holland to let either England or Germany continue to sell them all their supplies. Holland does not build railway supplies and formerly bought almost wholly in England and Germany. By buying at least part of our supplies in the United States we shall prevent either Germany or Great Britain from getting too great an interest in the business of our Colonial possessions."

French High Commission

The New York offices of the French High Commission which occupy two floors of the American Express building at 65 Broadway, present a scene of intense office activity. Speed and brevity are the order of the day, although all proceedings are tempered by delightful French courtesy.

Selling to railroad commissions forms a practically new experience to railroad supply concerns, and certainty not an undesirable method of securing foreign business. By coming to this country and doing business here with many American concerns the commissions have gone a great way in bridging the gulf between their and our methods of doing business. Although the commissions may be discontinued after the war, their coming will at least have been a great boon to the supply industry. In numerous cases American specialties have been purchased, and the American supply concerns have secured a foothold in the foreign market.

$54,000,000 W. S. S. IN MARCH.—Sales of War Savings and Thrift Stamps in March were $54,000,000, and brought the total receipts from that source in the four months since the War Savings campaign started to $128,000,000. Officials estimated, however, that actual sales, some of which have not been reported, have been about $150,000,000.

Canadian Engineers in France of Stern Stuff

"THE MEN WHO DRIVE the big mogul engines of Canada's ocean-to-ocean trains across the prairies and through the mountains are made of stern stuff and have nerves as steady as the steel roads they travel. You meet many of them here at the war."

So writes Roland Hill, from war correspondents' headquarters in France, regarding the operations of the Canadian railway troops. The story was received by the Canadian Militia Department and published in press despatches.

"There is the story of one of these engineers—in charge, too, of a 'built-in-Canada' engine—whose great hospital train had just completed lading at a siding when the Huns opened deliberate fire on the casualty clearing station. They said it was a reprisal for the 'bombing of German hospitals' by British airmen (British airmen, of course do not bomb hospitals). The track ahead had been hit but not broken by the shells which were ranging closer to the hospital with every shot. Without hesitation the Canadian engineer piloted his train safely over the damaged track to a clear line ahead and hundreds of helpless wounded were carried to safety. If the engine had ditched it meant certain destruction for the train.

Aid Salvage Corps

"Another driver, who had charge of a Canadian construction train at Gouzeaucourt when the Huns broke through after Cambrai, stayed with full steam up until all possible men and material had been loaded, and although the enemy were actually on the track behind him, tore down the grade to a safe siding well behind the new British line.

"The Canadian railway troops in their spare time have been assisting the hard-worked salvage corps. After Passchendaele they collected thousands of pounds' worth of British and German shells and hauled them back to the rear on their now famous light railways. Late one afternoon one large dump caught fire through spontaneous combustion or perhaps a defective shell, and in the first explosion half a score of men were wounded. A young Canadian engineer, a sergeant, who in peaceful days used to drive the Canadian Pacific Imperial Limited from Moose Jaw to the west, in spite of the bursting ammunition backed his little engine into the middle of the dump where the fire was blazing most fiercely. He connected up a hose with his main steam pipe and for half an hour pumped a stream into the burning mass, finally getting the fire under control. His little engine was pitted with shrapnel holes and his own escape was nothing short of miraculous. Several of the flying fragments tore his clothes. His example rallied other men and the fire was subdued before very great damage had been done.

" 'There was two hundred thousand dollars' worth of British shells in that dump. We couldn't stand by and see that go up,' he explained afterwards.

"And when the dump was safe he and his companions gathered the wounded into empty dinky cars and rushed them back along the little steel line to the safety of a dressing station."

EMPLOYMENT FOR ENGLAND'S DISABLED RAILWAYMEN.—Speaking at the annual meeting of the Lancashire & Yorkshire Railway, on February 13, Sir George Armytage, the chairman, said with reference to those members of the company's staff who were crippled while serving their country: "These men, I need hardly say, receive the most sympathetic treatment, and every endeavor is made, in accordance with the terms of our promise, to reinstate those concerned in their former positions, and in any case every effort is made to find employment for them."

The Locomotive Repair Shop Situation

The Railways Need Increased Facilities for Maintaining Power; Labor Must Give Its Best

TAKING THE COUNTRY AS A WHOLE the railroads are deficient in repair shop capacity and facilities. It is here that the government can, during its control of the railways, make the greatest showing in improvements to railway equipment. The lack of proper facilities for making both general and running repairs to locomotives was responsible to a large extent for the condition of the motive power last winter. While it was not the sole cause, it contributed very largely to the conditions. Some prominent men in the railway mechanical field have made the statement that it is not new locomotives the country needs, but properly repaired and well maintained locomotives. Facilities must be provided for this purpose. However, very few roads have made anywhere near in proportion the improvements in their shops that they have in their locomotives. Heavy power has been purchased with no provision for properly handling the repairs. This has not only made it necessary to hold these large locomotives with their proportionately increasing earning capacity out of service longer than should be necessary, but it has made it impossible to maintain them properly. The old saying, "a stitch in time saves nine," applies most aptly to repairing the large locomotives. Let them begin to pound or have excessive wear in their running parts and they soon hammer themselves to pieces.

What is needed most, particularly in the east, and far more than standard locomotives, is increased shop facilities for maintaining the power which has and will in the next few years be called upon to do a greater amount of work than ever before in the history of the country. Back shops are needed with adequate crane service and machine tool equipment for handling the heavy repairs. Improved terminal facilities are required that the light running repairs may be properly made. One road owning over 2,000 locomotives estimates that its repair facilities can only be brought up to the proper standard by an expenditure of over $10,000,000. Another road located in the east operating about 1,500 locomotives has only repair facilities for 750 and these are old shops with inadequate facilities. So great is the demand that one road is planning to equip various buildings with temporary facilities for repairing the lighter class of power, such as switch engines, and keep the larger shops free to handle repairs to the heavier power.

Those roads, which, because of lack of proper back shop facilities, followed the practice of making most of the light repairs in the engine houses, suffered greatly during the extremely cold winter because of this fact, their roundhouses being crowded with locomotives under repair and no house room being available for making the running repairs to the road locomotives. This necessitated keeping them outside where it was impossible for the men to do efficient work and where it was impossible to prevent locomotives freezing.

The motive power of the country, taken as a whole, is perhaps in worse condition than it has ever been before. It has been estimated that during the next seven months 60 per cent of the power must pass through the back shops for repairs, if the railroads are going into the next winter in proper shape. This means that almost heroic work must be done. Facilities should be improved to better meet the demands. Extensions to roundhouses which will permit more locomotives being taken under cover during the winter months will be money well invested. Additional inspection pits, strategically located, will contribute toward prompt repairs. A well designed and modern ashpit with adequate facilities for removing the cinders is important. A study should be made immediately of the conditions as they exist and improvements made where they will do the most good.

It is useless still further to overcrowd our shops and engine terminals with new locomotives unless provision is provided to take care of them. It may be possible to build during the next few months a well equipped, modern shop at some centralized point in the east to provide facilities for repairing locomotives for those roads whose repair facilities are so greatly overtaxed. No stone should be left unturned which will lead toward improved shop conditions that the roads may better maintain their power.

Repairing Locomotives in Foreign Shops

At the present time about 225 locomotives have been sent to those roads which are in a position to handle repairs to other than their own locomotives. It is a question as to how far such practice should be followed. In no case should a road be asked to sacrifice repairs to its own equipment for the purpose of helping out other roads, as the difficulties encountered in repairing locomotives of a design different from those of the roads to which they are sent make this practice costly both in time and money. Wherever this is done, the repairing road finds it necessary to obtain most of the repair parts from the owning road. The practices followed in the general details of construction are usually different and considerable time is required for the repairing forces to acquaint themselves with the peculiarities of the foreign locomotives.

The following while not strictly up to date will give some idea of the extent to which locomotives have been sent to foreign roads for repair since January 1:

A. T. & S. F.	8	M. P.	10
A. & N. M.	1	M. St. P. S. S. M.	2
A. C. L.	2	M. K. & T.	1
B. & L. E.	4	N. P.	3
B. & O. C. T.	2	N. Y. C.	10
B. R. & P.	1	N. Y. O. & W.	3
Belt Ry. of Chi.	1	N. C. & St. L.	4
C. R. I. & P.	7	N. & W.	2
C. & W. C.	1	N. Y. N. H. & H.	3
C. C. C. & St. L.	20	P. M.	5
C. & N. W.	7	P. L. W.	1
C. B. & Q.	13	P. & L. E.	7
C. St. P. M. & O.	2	Pennsylvania (West)	8
C. G. W.	3	So. Pacific	2
C. M. & St. P.	4	St. L. S. F. & T.	8
Cent. of Ga.	5	St. L. & S. F.	4
C. N.	1	St. Louis So. W.	1
C. & A.	2	Southern	11
D. L. & W.	5	T. & P.	1
D. S. S. & A.	1	Union Pacific	4
E. J. & E.	8	Virginia	1
Erie	2		
Grand Trunk	1	Total	222
G. C. L.	3	Am. Loco. Co.	10
G. M. & N.	2	Bald. Loco. Works	24
I. C.	15	Rome Loco. Works	21
K. C. S.	2		
L. & N.	5	Total	55
L. V.	2		
M. & St. L.	1	Grand total	277

Of this number 26 have been repaired and returned to the owning road.

When this practice was first started locomotives were sent indiscriminately throughout the country. It was discovered that some eastern locomotives were being sent to repair points 2,000 miles away. This, of course, was entirely impractical and with a concentration of such work in the hands of the Manager of the Locomotive Section, such occurrences need not now exist. It is the plan of Mr. McManamy, and a most logical one too, so to systematize repairs to foreign locomotives that one shop will handle only repairs for one road besides itself. Great care must be exercised in making inspection of locomotives that are sent to other roads for repairs, so that a full complement of repair parts will accompany the locomotives to the shop. Occasions have been found

where the work has been materially delayed because the more rigid inspection made when the locomotive was stripped, developed the need for repairs that were not reported. As the workmen in the repair shops become accustomed to the requirements of the road for which they are making repairs, the difficulties and delays will be reduced. In some cases it has been found necessary to send inspectors with full sets of detail prints and standard practices of the home road to the shops at which the locomotives are to be repaired. These inspectors should work with the shop forces and be given definite gangs, so that the workmen may be educated in the requirements of the owning roads, and these gangs should be kept solely on this work. They will soon become accustomed to the road's requirements and will be able to make the repairs with less confusion in the shop.

Cases have been reported of locomotives being sent as far west as Parsons, Kan.; Brainerd, Minn., and Ogden, Utah, to be repaired, all these locomotives coming from eastern roads. It would be far better practice to "step" the repairs westward, than to require the locomotives to travel such great distances for repairs.

Repairing locomotives in foreign shops is at best only a makeshift proposition and should not be done except in case of absolute necessity because of the hardships it will impose upon the repairing roads and the increased length of time a locomotive will have to be held out of service from the home road. If it is possible to increase the repair facilities of the owning road, this should be done by all means, as a great deal of confusion will be eliminated and there will be a net gain in locomotives repaired throughout the country.

The Labor Situation

Perhaps the greatest trial the railway mechanical officers have borne during the past year has been the difficulty of securing a sufficient amount of efficient shop mechanics and labor. Because of the extreme demand for mechanics of all kinds by the navy yards, munition works and on account of the draft, the railway shops throughout the country have been sorely hit. While it is true that the larger roads, taken as a whole, have about eight per cent more men working on locomotive repairs than last year, a large number of the men employed represent a class of labor that is unfamiliar with railway shop practice. This is particularly true in the East. It has been necessary to educate these men and generally speaking they have not been able to do the work efficiently. The labor situation, however, is becoming more stabilized and with the promise of consideration being given the workmen by the Railroad Wage Commission, the men have been more willing to remain on the job.

Due to the law of supply and demand, the railroads have been forced to increase the wages to the men in order to hold them. With these increases in wages, however, it has been increasingly difficult to keep the men from laying off. To overcome this situation one road has granted a bonus of one minute per hour to men who have not absented themselves from work during the week. The matter of absentees is an important one and every possible attempt should be made to appeal to the patriotic duty of the men to remain at work. It is no longer necessary for each one in this country to do his "bit," *but each one of us must do all that is possible to the limit of physical endurance.* The men must be made to realize the seriousness of the situation. They must be made to feel that the government is depending upon them to provide the railways with adequate power.

It is necessary, if the roads are to go into the next winter in good condition, for labor to give its full time. In fact, the matter is so tremendously important that the Manager of the Locomotive Section of the Railroad Administration has issued orders to increase the working hours of railway shops, where necessary, for making proper repairs to the locomotives, to 70 hours a week. Some roads have done this; others have not. The success with which this order can be met depends a great deal upon the manner in which it is handled. One road on which it was attempted to put this order into effect, issued a notice to the men an hour or two before closing time, requiring the men to start that night on the 70-hour schedule. This was manifestly unfair to the men, and as might be expected, was met with a great deal of opposition. After two days' trial the plan was considered a failure and discontinued. A representative of the Railroad Administration, however, consulted the representatives of the shop men and even addressed the men en masse. After explaining to them the necessity for the overtime and the importance of properly repairing the locomotives, the system was again scheduled to go into effect a few days later with lasting results. To obtain the 70 hours a week, some shops are operating 10 hours a day for the entire seven days. Other shops are working 14 hours on Monday, Tuesday and Thursday, 10 hours on Wednesday and Friday and nine hours on Saturday, leaving Sunday free for the workmen.

Labor Must Do Its Part

Some shops are arranging to provide for the increased output where men can be obtained, by working night shifts. This, of course, is a desirable thing to do where possible. In every case, however, all shops, regardless of the condition of the motive power on their particular road, should increase the working hours in order that they may lend assistance to roads whose repair facilities may not be sufficient to meet their needs. It is a time for the closest co-operation and every assistance must be given to the weaker roads.

Labor must be ready to do its part in this gigantic world struggle. Those roads that have become strongly unionized are bound hand and foot by agreements with organized labor, which make it practically impossible for overtime to be obtained without greatly increasing the cost of labor. One labor agreement which was put into effect the middle of last year, which is distinctly unfair to the railroads and may be justly termed unpatriotic at the present time, reads as follows: "Overtime shall be paid for at the rate of time and one-half for all service after the hours in force (eight-hour day) up to the end of the first hour immediately following the shift upon which employed. If required to work after the first hour immediately following the shift upon which employed, five hours will be allowed for 3 hours and 20 minutes, or less service." Here the road, if it attempts to even work a 10-hour day, is required to pay for 14½ hours, and this contract was made while our nation was at war. This same contract also reads: "When vacancies occur in foreman or gang boss positions, men from the class represented in this agreement will be given preference in promotion, seniority, character and ability to govern." This rule certainly removes the incentive for good work and it makes it practically impossible to secure the best supervision. Whether or not the Railroad Wage Commission will permit such agreements to exist, remains to be seen, but in view of the necessity of the government for this class of labor, it seems hardly possible that even the government will permit such absurd labor contracts.

Throughout the past winter labor has been subjected to very trying circumstances. Due to the lack of adequate facilities, much of the repair work had to be done outdoors, which during the exceptionally cold winter made it a physical impossibility to have the work done properly. Even inside in some places, with the average arrangements for heating roundhouses, it was not possible for a man to perform an efficient day's work. In addition to this there were natural losses of efficiency because of many of the men laying off on account of sickness due to the extreme weather conditions.

Laborers in the mechanical department have been ex-

tremely difficult to obtain. This has been felt more in the south, where negro labor obtains, than ever before on account of the increase in laborers' wages paid by industries and the fact that a large number of negroes were brought north to fill in the gaps there.

Throughout the winter extreme difficulty has been experienced in maintaining proper roundhouse forces. The conditions have been so trying that it has been almost impossible to get the men to stick and the percentage of absentees mounted to a very large figure—for some roads at some periods during the winter, being as high as 40 and 50 per cent. The ashpit men were particularly hard hit and it was not an uncommon occurrence for a whole ashpit crew to quit in the middle of the night or during the day through some of the extremely cold weather. This all makes necessary the provision of adequate facilities for handling this class of work in order that it can be done with a minimum of discomfiture to the men.

The discipline maintained at some of the shops has, on account of the difficulty that has occured in keeping the men at work, been allowed to sag. This is disastrous in any organization and will do more to decrease the efficiency of the shop than most any other one thing. The class of supervision obtaining is generally responsible for such conditions. The supervising officers must insist upon proper respect and hold the men strictly to their tasks.

It has been found necessary throughout almost the entire country, and particularly where the labor turnover has been very large, to increase the number of foremen or supervising officers in the shops. The class of labor now being obtained is such that unless adequate supervision is provided, either through gang foremen or demonstrators, it will take a long time to bring the quality of work up to the proper grade. Some roads have complained of the difficulty of obtaining competent foremen and of even retaining the foremen in their positions. In a very large number of cases, the difficulty thus encountered is due to the fact that the supervising officers have not been granted an increase in wages in proportion to the mechanics or men working under them. It is impossible to expect a man, undoubtedly a good mechanic, who is capable of holding the position of foreman, to give his best work and remain satisfied when the men under him are receiving more in wages than he obtains in salary. Some roads have been quick to recognize this and have granted the supervising officers increases of even a larger per cent than was given the men. Such roads have had no difficulty in retaining the foremen and they have been willing to work as never before to pull their roads out of a serious situation. Full cognizance must be given to this condition and it must be remembered that labor or workmen without a competent leader will never give maximum output.

The Labor Shortage in the Maintenance Department

A Resume of Possible Sources of Supply and of Means of Reducing the Demand for Men

THE AMOUNT OF WORK which the railways can do this year depends directly on the quantity of labor which can be secured. The supply of materials of certain kinds is inadequate, but priority regulations can be so administered as to meet the most pressing needs. However, there are no priorities as to labor. The shortage is universal. Industries are working with only partial effectiveness because of a lack of men. The shipyards are handicapped for the same reason. It is not therefore surprising that the roads, which employ normally about 450,000 men in maintenance of way work, are short from 10 to 50 per cent of their forces, depending on localities. Not only are the railways facing a shortage of track and other maintenance labor now but this condition will continue. The problem is therefore to prepare for the future as well as for the present and to adopt those measures which will be of most lasting benefit.

The causes of the labor shortage are those common to all industries—a demand far exceeding the supply, supplemented by the withdrawal from productive work of large numbers of men for military activities. The result has been a general moving up into the better paying trades of the men formerly classed as unskilled laborers, leaving these ranks most depleted. In those industries employing skilled mechanics such shortages as have existed have been caused by increased demands for men more than by desertions to other work, while in maintenance of way work the reverse has been true and it has been impossible to retain even normal forces.

The shortage varies widely from one locality to another. It is least evident in the agricultural communities and those removed from industrial activities. In such places it has generally been possible to maintain normal forces and in some instances to recruit floating gangs for service in districts less fortunately placed. The greatest difficulty is being encountered in the industrial centers in the east where men cannot be held in the face of the high wages offered by industries. In many such places the forces have been so depleted that it has been impossible to do more than patrol the tracks and do the most urgent repair work, postponing all other work.

With the shortage over the country becoming steadily more acute, little hope can be held out for relief this summer. Instead, with the speeding up of the ship building program and with the continued withdrawal of men for military service, the shortage may be expected to become more acute. The problem confronting railway men is that of developing new sources of supply of labor and of using the men available more efficiently to increase the unit output of work per man.

Increasing Sources of Supply

For many years track forces have been recruited largely from the immigrants coming from Europe, but with the outbreak of the war in 1914 this source was closed. As a matter of fact the number who have returned to Europe since August, 1914, has greatly exceeded that of men entering the United States, so that the net result has been a severe drain on the labor supply of the country. No relief can be expected from this source until the close of the war.

The next most inviting source of labor is Mexico. Up to a year ago Mexicans were coming into this country in increasing numbers and were the main reliance of the roads in the Southwest, but with the imposition of a head tax, and a literacy test by our government in legislation which became effective on May 1, 1917, this source of labor was shut off, for almost none of the Mexicans can pass these requirements. It is understood that large numbers of Mexicans are willing to work in the United States if it were made possible for them to do so, but in spite of the urgent need for them, the government has taken no step publicly to bring them in.

Many railway men have urged that the restrictions against the importation of Chinese labor be raised for the period of the war. Large numbers of men can be secured in China of a class which makes good workmen. England

has transported over 150,000 across Canada to France, where they are employed in civilian work in the interior. China possesses a surplus of labor sufficient for our needs. However, public sentiment, particularly in the western states, is so strong against Oriental labor that there is little hope of securing relief from this source.

The most promising field for the importation of labor is Porto Rico. Investigations of the United States department of labor have shown a large surplus there and statements have been made from time to time that as many as 100,000 to 150,000 men would be brought into this country in the near future. As early as last fall it was announced that plans had been perfected to bring these men in but so far none have arrived. If they are secured, these men will necessarily be distributed mainly in the south where climatic conditions approach those to which the men are accustomed. It is doubtful if any noticeable relief will be secured from this source in the north.

It would seem therefore that no great relief can be expected from outside the United States except in so far as help may be secured from Porto Rico. Within our own borders much comment has been made regarding the employment of women in the maintenance of way department. Some roads have hired considerable numbers for a short time but in general they have not proved successful. While they can be employed in clerical positions they will not offer any material relief in the general run of maintenance of way work.

A greater benefit can be secured through the recruiting of boys 16 to 18 years of age for track work. While the agitation for the enlistment of boys in farm work will draw many in this direction this year, a number of boys of high school age are to be found in almost every village for whom railroad work holds a fascination. By taking the proper measures, many of these boys can be recruited for maintenance work, either as members of regular gangs or in gangs by themselves. One eastern road which gave this subject special attention last spring, sent its supervisors to speak before the older boys of the high schools in the towns along its line, pointing out the advantages of track work during the summer. As a result as many as 150 boys were employed on single divisions. These boys were organized into separate gangs and were assigned to ditching and similar work, but in general were kept off the track itself. In this way it was possible to keep the men working on the track and still to complete much of the other work. If this plan were developed throughout the country it would mean a considerable addition to the available track forces of the country.

Working Conditions

In general maintenance forces are recruited by the individual roads through their foremen locally and through labor agents in the larger centers who are either directly in the employ of the roads or work on a fee basis. This year the government has stated that it is prepared to secure the men desired by the roads through its national and the state agencies with which it is affiliated. It has intimated further in some instances that it is prepared to supplant the organizations maintained by the roads in previous years to secure men. Railway officers are inclined to look at this suggestion with some apprehension, for in spite of frequent assertions to the contrary the government-operated labor bureaus have not shown any marked ability to supply experienced railway labor in the past. Railway men will welcome any help which the government-operated bureaus can render them this year but it would appear highly advisable to retain those methods in use previously until the ability of the government to provide the desired men has been demonstrated.

One wasteful practice incident to the present methods of hiring men for which a practical remedy has not yet been secured is that resulting from shipping labor long distances. As long as this practice is followed, certain classes of men will continue to hire out for work far removed from the point of employment. The waste of time and of transportation in hauling large numbers of men across the country in this way is great. At the same time, it cannot be eliminated entirely for it is necessary to take the men from their headquarters to the site of the work if the work is to be done. Any proposal to prohibit the shipment of men to work will create a hardship on the job away from the city which it will be difficult if not impossible to overcome.

The wage question assumed a prominent place in all studies of the labor situation last year and it will be even more important this year. It is to be expected that wages will rise in any period of labor shortage. It is also the experience that this rise is facilitated in every such period by the bidding of one road against another, the only effect of which is to increase the cost to all, without benefiting any one, as few new men are drawn into the work. To overcome this practice there is a feeling among many railway men at the present time that, as the roads are now operated under a common control, a uniform rate should be paid on all roads, at least in a common territory. This will effectively stop all bidding of one road against another with its resulting demoralization. However, once established, the tendency will be to standardize this wage over too wide an area and to place too great an impediment to its change, with the result that authority will have been taken from local officers to make changes on their own initiative to meet local conditions quickly as they arrive. While it is not desirable for one road to compete with another for men, particularly under present conditions, each road must compete with the farmers and the industries along its lines for men. Any regulation which removes from the men on the local road the authority to meet this competition gives all the advantage to the industry with the result that the roads will be more seriously handicapped than before.

Conserving Men

With the scarcity of men, which is certain to prevail this year, it is to be expected that they will be harder to hold on the work than ever and that the turnover will be higher even than last year. Men will leave on the least complaint, or on no complaint at all. High wages foster rather than arrest such tendencies, for those men whose sole ambition is to earn a stake will get it quicker and therefore work a shorter time.

A feature which will be given greater prominence than previously will be the provision of more comfortable housing facilities and more attention to boarding. A great improvement has been made in the character of many of the camps, but these modern camps are still so few as to constitute the exception. When the men have the power of selection as they have this year, it is to be expected that they will prefer to work at those places where modern conveniences are provided and will refuse to stay at other camps. This will lead to the more general installation of modern conveniences, first at those points where labor is most difficult to hold and then to points of less difficulty.

With the lack of an adequate supply of labor this year there will need to be more supervision to get the best results from that which is available. Division engineers, supervisors and foremen will need to employ their men so as to get the most work from them and create the least lost motion. Jobs should be planned well in advance and every opportunity taken to secure the most efficiency from the forces.

Of equal or greater importance is the necessity of substituting mechanical equipment for men wherever possible. The maintenance of way department has been very backward in this work and as a result railway men and manufacturers alike have made little progress in the development of labor saving equipment. It is true that the motor cars and

certain other devices have come into general use but these are exceptions to the general practice. Now when labor cannot be secured, there is a great demand for machinery which will do the work of men and this year will probably see the introduction of many new devices. In the meantime it is important that equipment be used in place of men wherever possible, even where there is no reduction in the cost of doing the work, although in nearly all cases the adoption of mechanical equipment is accompanied by a decrease in the cost of doing work.

Conclusions

In brief, the supply of men is insufficient for this year's demands. No help can be expected from European immigration. Men are available in Mexico, but the immigration restrictions prevent those who are willing to come from entering this country. China has a surplus of labor, but the sentiment in the west will not permit any letting down of the bars against their entrance. Some relief may be secured from Porto Rico. However, the most ready means of assistance lies in the employment of boys in the work for which they are best suited. With the inadequate forces under the most favorable conditions railway men can also conserve their own interests by providing such arrangements for the care of the men as will tend to hold them on their work. Material relief can also be secured through the adoption of labor saving equipment wherever it can be adapted to the work in hand.

How the Export Houses Help in Foreign Trade

The Reliable Export Firms Can Offer Many Advantages to the Railway Supply Manufacturer

By Homer C. Johnstone

Manager Steel & Railway Supply Department, Gaston, Williams and Wigmore, Inc.

THE WRITER HAS BEEN REQUESTED to outline the advantages presented to the manufacturers of railway supplies for extending their business into foreign countries through the aid of the reliable export firms of this country.

The first question that confronts the manufacturer, and it is a serious one, is how to introduce his goods to foreign markets. There are several ways. The first that suggests itself is to place advertisements in foreign papers, in the language of the country, setting forth the desirability of his particular product. This necessitates considerable initial expense and the results obtained by manufacturers who have tried this method have been very unsatisfactory, for they find that, even though the advertisement arouses interest in the product advertised, by the time a letter of inquiry, written in the language of the country and necessitating translation, is received here and replied to, several months have elapsed and the interest of the inquirer has waned. Even should an inquiry develop into an order, the manufacturer is generally unacquainted with the methods of packing goods for foreign shipment, with the ways and means of getting steamship space at a rate on which he can count and with money values in foreign countries. Also, he is handicapped in ascertaining the credit of the concern to which he is shipping, in consequence of which he is left with an indefinite idea as to the actual sum of money he will make on the transaction, if it goes through, and is, therefore, compelled to demand money deposited in a bank in this country to make safe the financial end.

All of this process covers a long period, if it is done by writing, and costs a good deal of money if done by cable, making the transaction unsatisfactory in the long run and very slow in operation.

There is another method which has been tried without showing returns for the expenditure involved. This has been to send a special man to a certain country. He calls upon the trade and immediately finds himself handicapped if he does not speak the language of the country. While he may take a small initial order, he is very soon forgotten when he goes away, as is also his product. The writer has known firms to spend a good many thousands of dollars in endeavoring to introduce their products in this way and, after several years, find the returns but a small fraction of the money expended.

The modern export company of today, with its organizations in various trade centers of the different countries, offers to the manufacturer the following facilities:

Offices equipped, generally, with an American manager having under him salesmen of the country in which the office is located, and, therefore, speaking the language. These salesmen go out and call upon the trade, having lists of various customers in the various lines. They, of course, by their frequent calls, have become acquainted with the trade and are able to present to customers, in an intelligent manner, the advantages of the product they wish to introduce. If the product is a specialty, they have to depend upon the information they have received from the manufacturer, through the home office, catalogues and other literature. Should the device be so special that it needs a man from its own factory to introduce it, this man could be sent over, accompany the salesman who speaks the language and introduce the product in that way. When he left, the salesman would have absorbed sufficient information to carry on the campaign in the future.

These foreign offices of the large export companies handle a great deal of material and advertise in the countries in which they are located, so they become a sort of center for inquiries regarding American products. Also, the export companies handle imports and are, therefore, buying and trading with the various merchants abroad, which keeps them in closer touch. They are able to make a price, as expressed in the money of the country, and the purchaser knows exactly what the material is going to cost when it arrives. Buyers in foreign countries, in ordinary times, are loth to pay for material until it has been delivered. This facility the foreign office of the export company can extend to them because of its acquaintance with the financial standing of concerns abroad.

Starting a Foreign Trade

The modus operandi of starting a foreign trade through one of these export companies would be as follows:

The manufacturer would first get in communication with the export company and state the country or countries in which he desires to introduce his product. If the export company is not versed in the appliances of a similar nature or design used in the country or countries in which it is to be introduced, it can, by correspondence with headquarters

in those countries, have the situation canvassed and, in a month or so, furnish the manufacturer with an intelligent statement as to the possibility of placing his product on the foreign markets. After this information is obtained, if it is still desirable to acquire the business, the manufacturer can, through the export company, send abroad a letter, written by his expert and descriptive enough to give the salesman on the other side a working knowledge. Then, the salesman of the export company abroad can start his campaign. On the orders which might result from this, the export company will buy the the material direct from the manufacturer and take all the risk of shipping and safe arrival of the material, as well as the risk of the credit. The manufacturer will get his money at the mill, and know exactly what profit he will make in each instance. He will, therefore, save a large expense in advertising abroad and in the cost of sending representatives to canvass the foreign market.

The exporters or, as some firms call themselves, international traders, who have these foreign offices fully equipped for handling export and import trade, offer facilities along the line above mentioned that have never before been presented to the people of any country. The volume of their business enables them to obtain these various offices, and the salesmen in connection therewith, at a minimum expense compared with that which any single company, regardless of its size, could do in handling only one product. The cost to the manufacturer in introducing his product to the foreign trade is, therefore, very small.

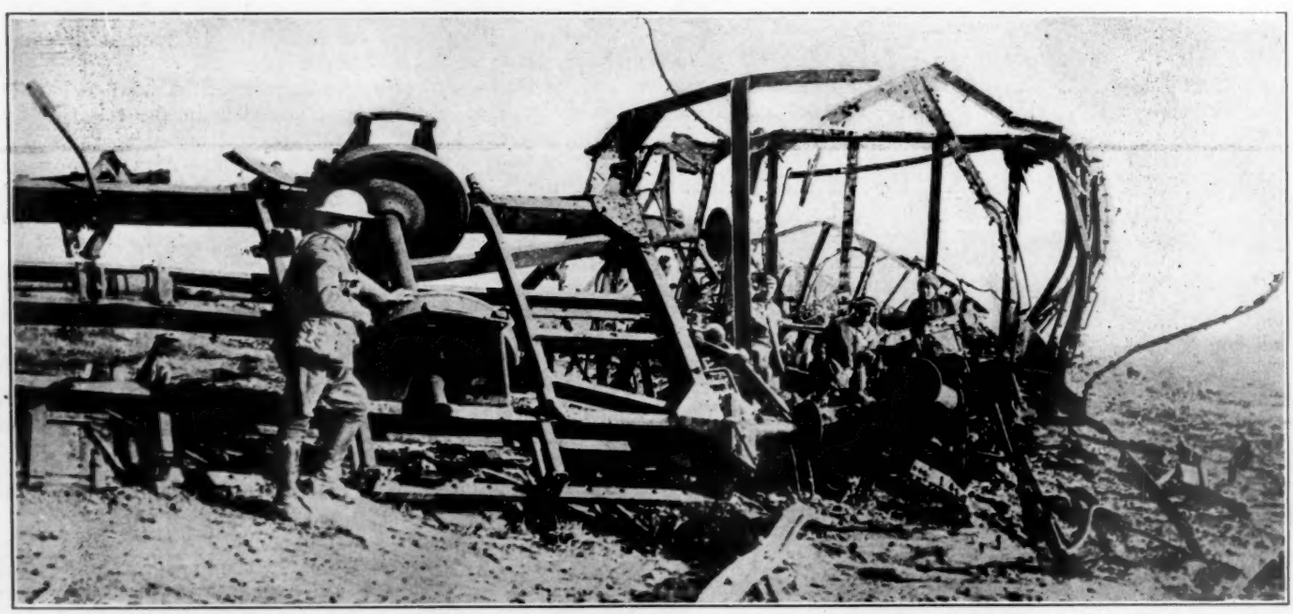
The writer knows of one manufacturing concern in the West which spent a number of years and a good deal of money, advertising abroad in an effort to introduce its machine. The only result was a casual letter, in some foreign language. When the letter had been translated and answered, in 99 cases out of 100, nothing further was ever heard from it. After a number of years, therefore, they had sold a few machines. Then they went to an international trading company and, as a result, their descriptive matter (including a letter sufficient to acquaint the foreign offices with the advantage of the product to be introduced) went to every office of the trading company abroad, immediately, from Tokyo to Capetown and from Rome to Valparaiso. Accordingly, 14 offices, distributed all over the world, right away took up the pushing of this machine and the result has been a large number of cabled inquiries and of letters asking about the machine, its price, terms, etc. In a few months, therefore, this manufacturer has had an introduction to the world that he could not have acquired through any other source or means.

We have known of manufacturers, who have either paid the entire expense of a man to cover a country, or a considerable part of it, and allowed the man to carry several other accounts, endeavoring to market their railway equipment in a country that had no cars on which the equipment could be used, under any circumstances, and the net result of their ventures was simply a large expense account.

If the manufacturer of railway supplies in this country will co-operate with the large, reliable merchants who are able to offer these facilities, it will simply be a question of time when these concerns can afford to establish specialty men on railway equipment in a large number of their offices abroad and the interests of the manufacturer would be taken care of just as carefully as they are in his various offices in this country.

Keep in mind that the magnitude of the business of these international merchants enables them to handle a product on a very small percentage of profit, probably less than a manufacturer might pay in extra freight and handling charges, being unaccustomed to the shipping proposition, to say nothing of the losses that would come to the manufacturer from credits which he would have to give abroad, in ordinary times.

The position at the present time, because of shortage of shipping and abnormal conditions all over the world is, of course, exceptional and what the writer has said is not applicable to a crucial time like the present in the same proportion to which it would apply under normal conditions. However, now is the time for a manufacturer to lay his plans to obtain information and to get in touch with the foreign situation so that, when ordinary business methods are again assumed, foreign trade will have a foundation laid. Of course, after the start, the future of the product depends upon its own intrinsic worth, as well as the manner in which it is kept before the eyes of the consumer.



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The Ruins of an Ammunition Train Hit by a Shell

Designs of the United States Standard Cars

Simple Construction, Interchangeable Parts and Use of Pressed Steel Noteworthy Features

IN THE ISSUE OF THE *Railway Age* for March 29, the specifications for the United States standard box cars were printed on page 785. The principal drawings of these standard cars have been reproduced and are shown in the following pages. From a study of these drawings in connection with the specifications, it is quite apparent that the government's standardization committee has provided some cars which no railroad need fear to operate. The designs are simple yet strong.

Every attempt has been made to make as many parts of the cars as possible adaptable to more than one design, in order to reduce the number of dies, patterns, etc., the builders must make in constructing the cars. It is noteworthy the amount of pressed steel shapes that have been used in the designs and the small amount of commercial shapes. Where commercial shapes have been used, however, a strenuous attempt has been made to use the same shapes. For instance, the 12-in., 35-lb. channels are used to a large extent for the center sills. The end sills, and in some cases side sills, are made up of 9-in., 17.44-lb. shipbuilding channels. In the open-top cars a 13.2-lb. bulb angle is used on practically all the designs. The draft sill arrangement is identical, with the exception of some details, to all cars, and a standard distance of 12⅞ in. is maintained between the center sills.

In addition to this, detail parts have been made of the same designs where it has been possible to do so, among which may be mentioned the body center plate, body side bearing, front draft lug, striking plate, coupler yoke key and cotter, coupler carrying iron and ladder rounds and grab irons. These are common to all of the designs. There are also other parts which are common to more than one design. For instance, one design of body bolster, center brace, rear draft lug and draft sill is used for the 40- and 50-ton single sheathed box cars, the 50-ton steel gondola and the 50-ton composite gondola. The trucks are similar in construction and have a center plate and center plate support common to all three. The limiting dimensions for brake beams is also

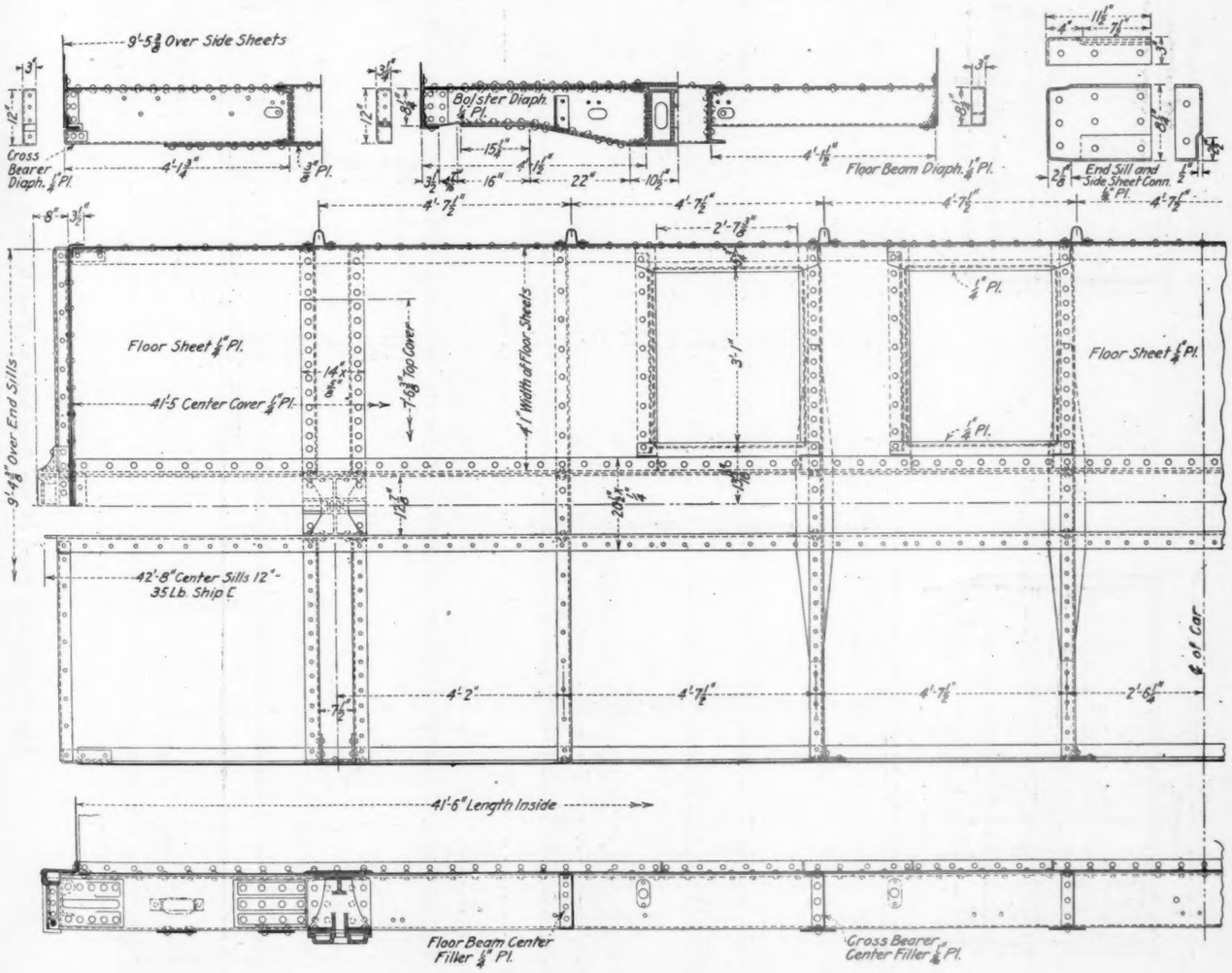

9'-5⅜" Over Side Sheets
Cross Bearer Diaph. ⅜" Pl.
Bolster Diaph. ⅜ Pl.
Floor Beam Diaph. ⅜" Pl.
End Sill and Side Sheet Conn. ⅜ Pl.
Floor Sheet ⅜" Pl.
41'-5 Center Cover ⅜" Pl.
7-⅝" Top Cover
41" Width of Floor Sheets
9'-4⅜" Over End Sills
42'-8" Center Sills 12"-35 Lb. Ship C
41'-6" Length Inside
Floor Beam Center Filler ⅜" Pl.
Cross Bearer Center Filler ⅜ Pl.
½ of Car

Fig. 1—Underframe for the Standard 50-Ton Steel Gondola Car

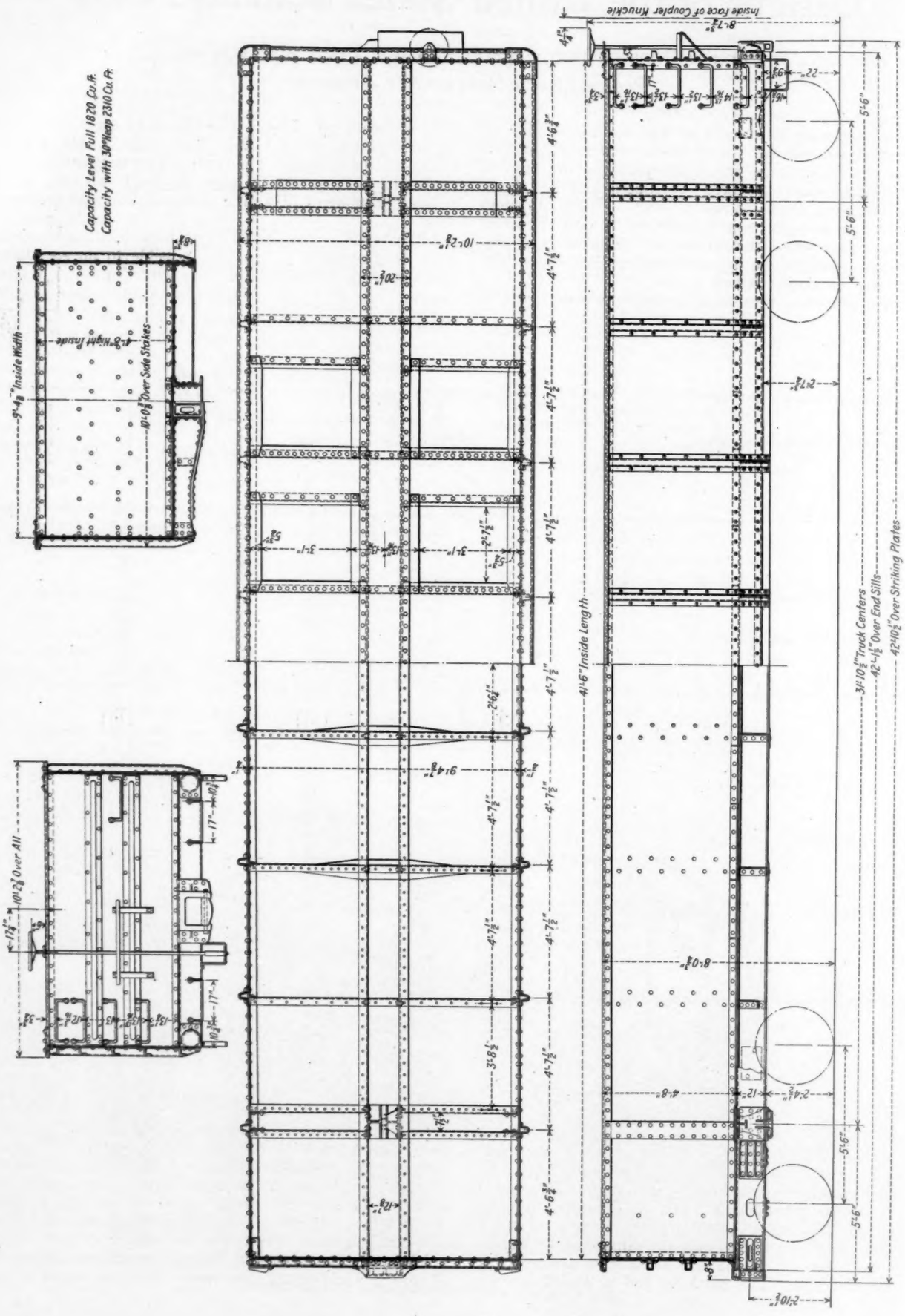


Fig. 2—General Plan of the Standard 50-Ton Steel Gondola Car

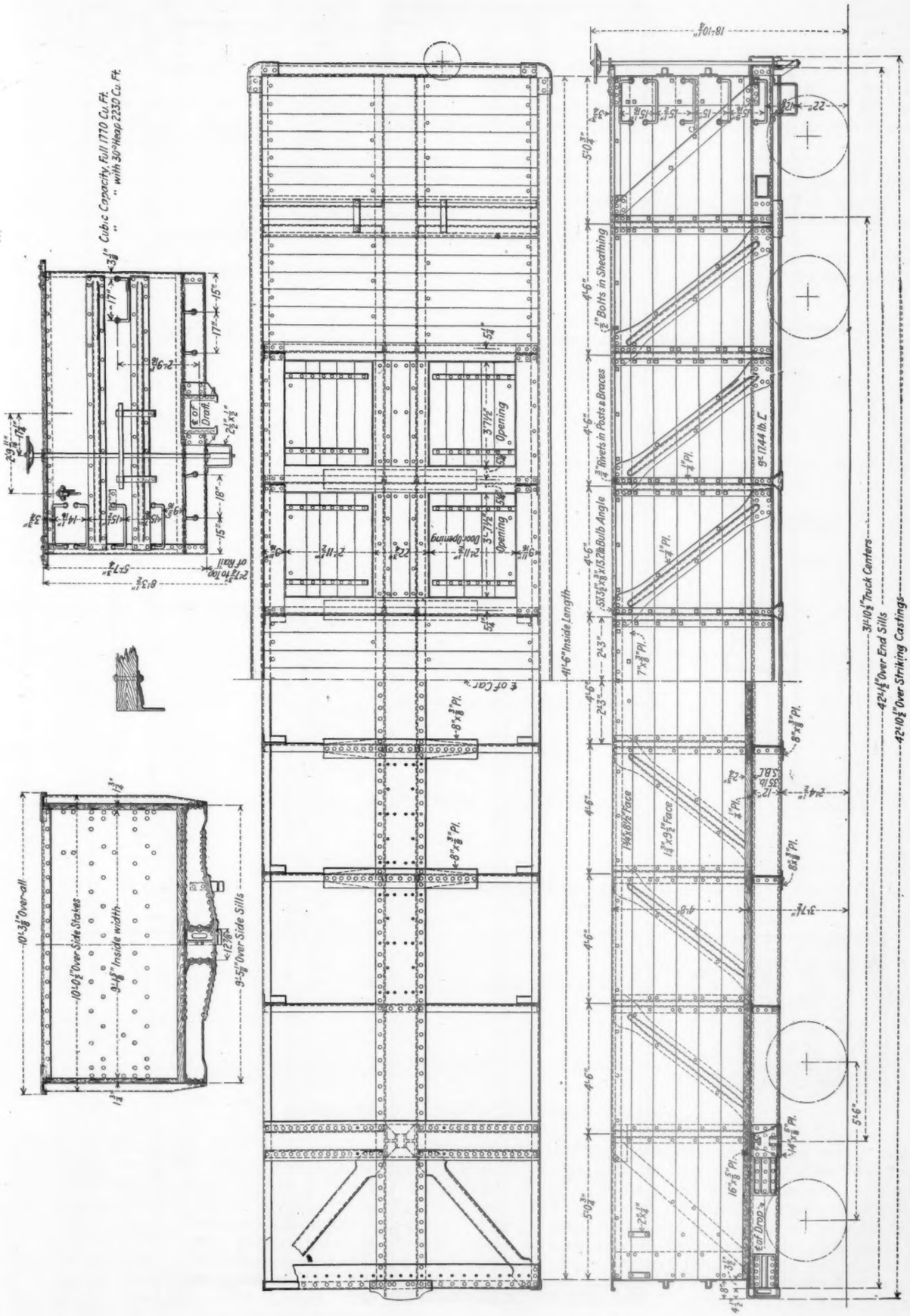


Fig. 3—General Plan of the Standard 50-Ton Composite Gondola Car

Fig. 2—General Plan of the Standard 50-Ton Steel Gondola Car

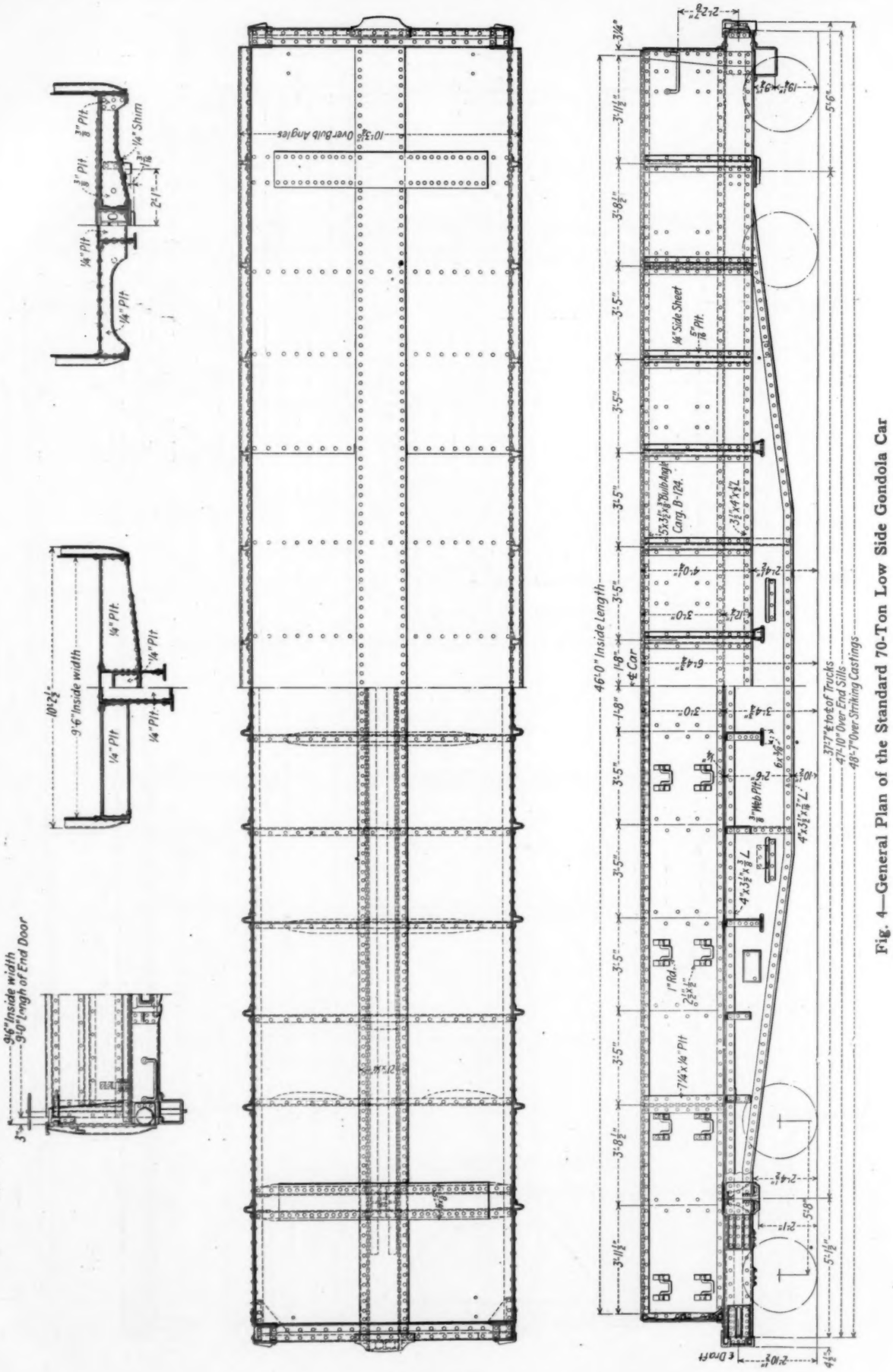


Fig. 4—General Plan of the Standard 70-Ton Low Side Gondola Car

the same. Following is a brief description of the details of construction of the cars, which will facilitate a study of the drawings.

Gondola Cars

There were three different designs of gondola cars adopted, namely a 50-ton high side composite car, a 50-ton high side all-steel car, and a 70-ton low side all-steel car. These are shown in Figs. 1, 2, 3, 4 and 5. There is a marked similarity in the general dimensions between the 50-ton steel and composite cars.

Fifty-Ton Composite Gondola.—This car has an estimated weight of 40,000 lb. It has eight drop doors swinging from the center sill, the general plan being shown in Fig. 3.

The underframe in common with the other designs is made up of a number of steel pressings. The center sills are 12-in. channels, having a standard distance of 12⅞ in. between the webs and a top cover plate 20½ in. by 1¼ in. There are four crossbearers of the fish-belly type, made up of ¼-in. pressed steel diaphragms, having top and bottom cover plates of 8-in. by ⅜-in. material. The side sills are 9-in., 17.44-lb. shipbuilding channels. The body bolsters are built up of steel diaphragms made from 5/16.-in. steel plate, having top and bottom cover plates of ⅝-in. steel. The end sills are 9-in., 17.44-lb. ship channels, the same as the side sills.

The body of the car has eight U-shaped pressed steel stakes on each side and six braces of the same material. These are made from ¼-in. plates and are 7¼-in. wide and 3½ in. deep. The end braces are also pressed from a steel plate in U-section, being 7¼ in. wide, 4 in. deep and ¼ in. thick. There is a 5-in. by 3½-in. by ⅜-in., 13.2 lb. bulb angle, extending around the top sides and ends. The floor boards used on these cars are 2¾ in. thick and the side boards are 1¾ in. thick.

Fifty-Ton Steel Gondola Car.—This car has an estimated weight of 42,000 lb. As in the composite design, it has eight drop doors which are set flush with the floor. The general plan of this car is shown in Fig. 2, and the underframe is shown in Fig. 1.

The chief difference between the underframe of this car and that of the composite gondola is in the crossbearers and side sills. The crossbearers are straight, being made of ¼-in. pressed steel pans 12 in. deep. They have bottom cover plates ⅜ in. thick and 5 ft. 8½ in. long, with no top cover plate. The side construction consists of 3½-in. by 3-in. by ½-in. angles and side stakes of the same dimensions as those used in the composite car, but made from 5/16-in. plate. The end braces and the end sills are the same as used in the composite car. Both the floor and side plates for this car are ¼ in. sheets, and the same bulb angle is used at the top of the sides as on the composite car.

Seventy-Ton Steel Gondola.—This design has an esti-

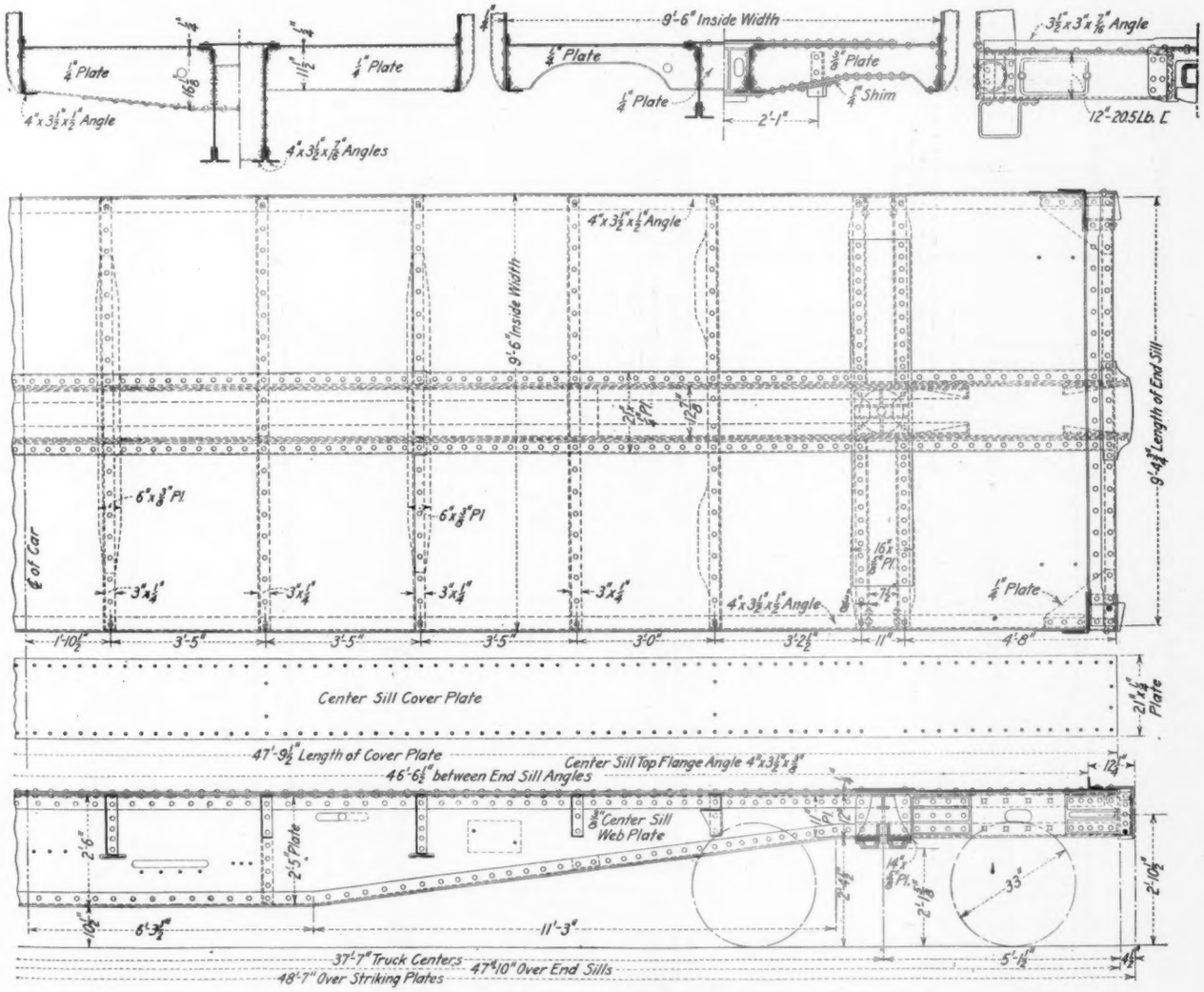


Fig. 5—Underframe for the 70-Ton Steel Gondola Car

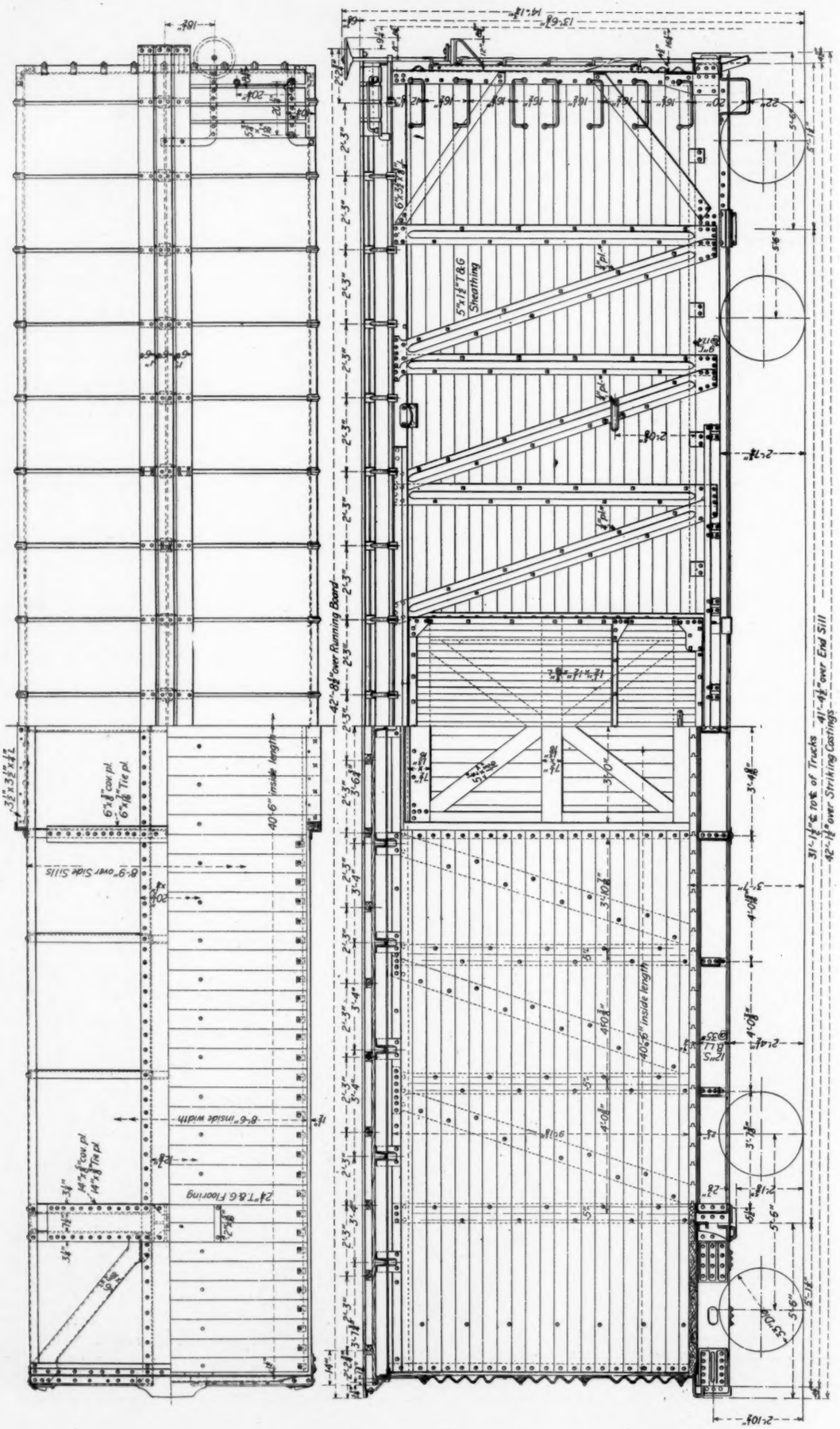


Fig. 6—General Plan for the Standard 40- and 50-Ton Steel Frame, Single Sheathed Box Car

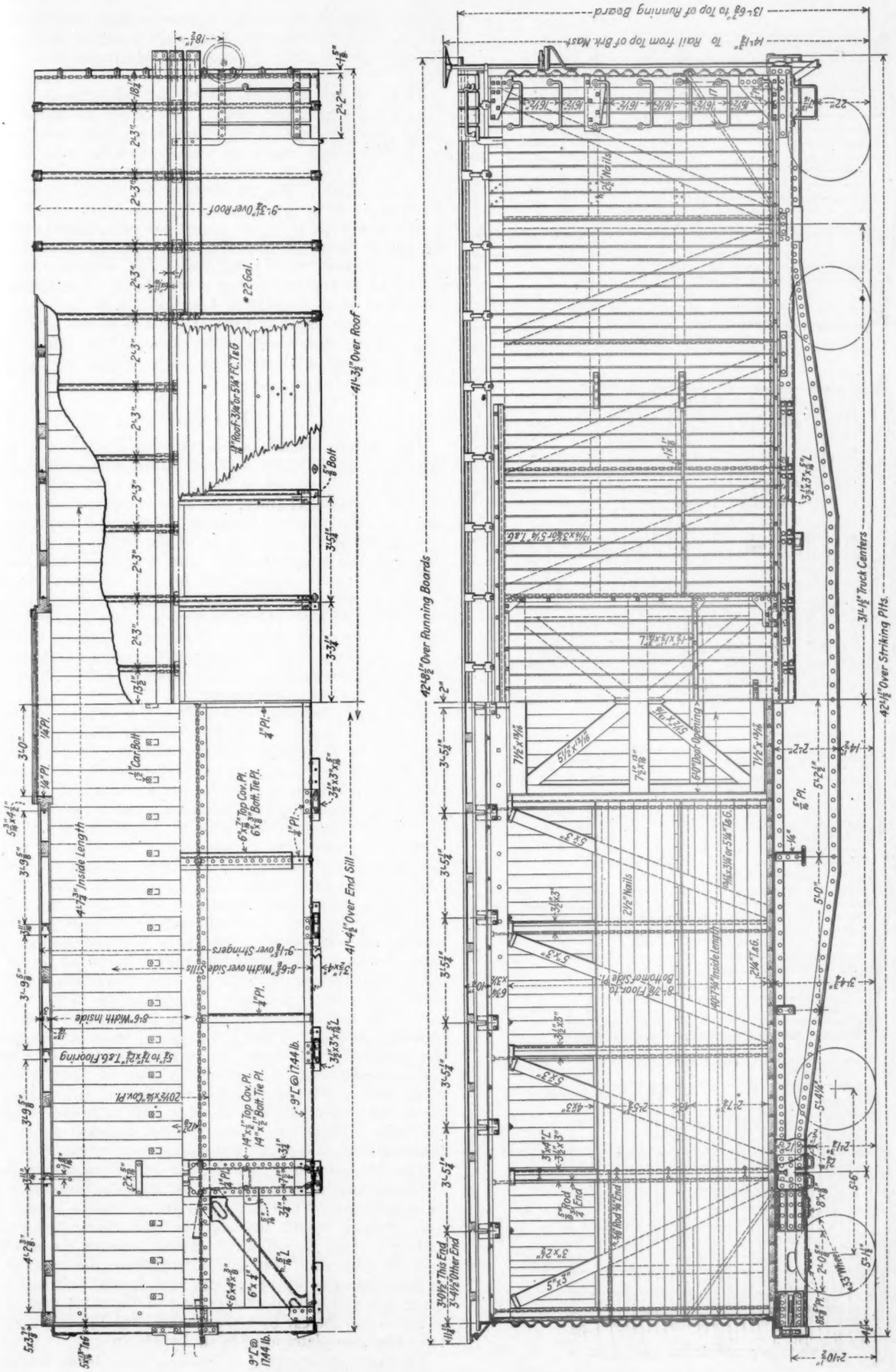


Fig. 7—General Plan for the Standard 40-Ton Double Sheathed Box Car

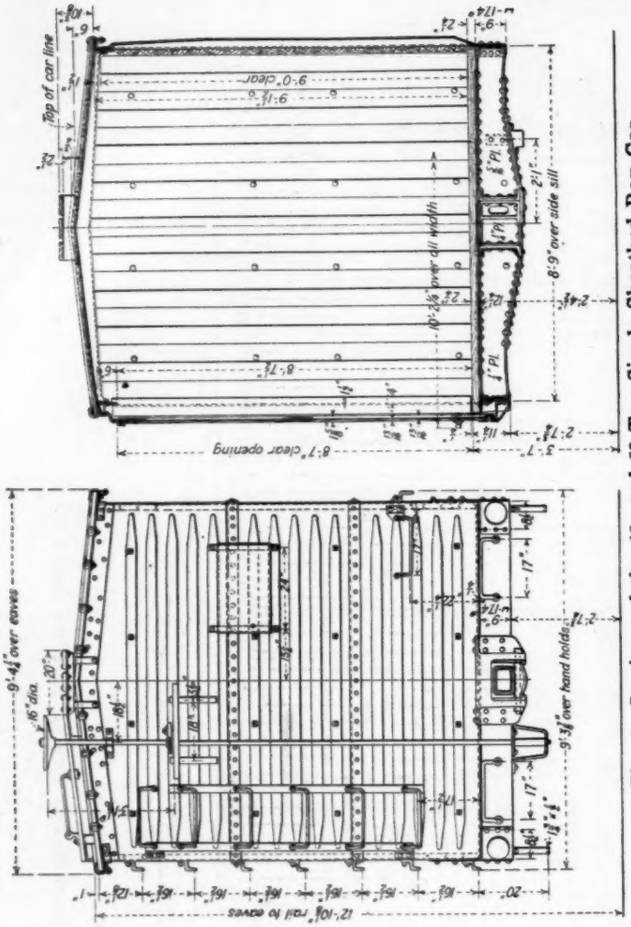


Fig. 8—Sections of the 40- and 50-Ton Single Sheathed Box Car

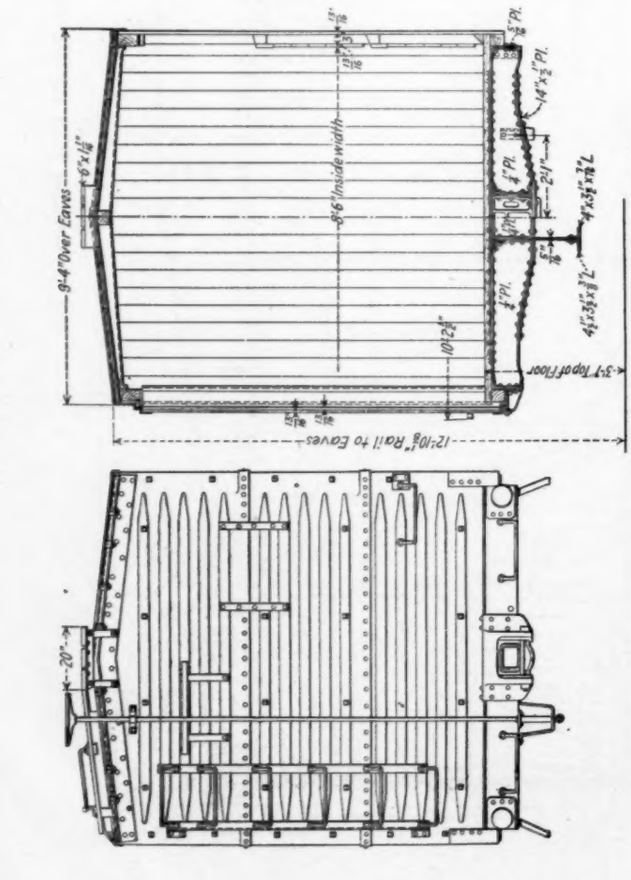


Fig. 9—Sections of the 40-Ton Double Sheathed Box Car

mated weight of 49,500 lb. It is to be built entirely of steel and is provided with drop ends. The general plan of this car is shown in Fig. 4, and the underframe is shown in Fig. 5.

This car has a center sill of the fish-belly type, being 2 ft. 6 in. deep at the center. The center sill girder has a ⅜-in. web plate with a top flange angle 4 in. by 3½ by ⅜ in., bottom flange angles on each side of the webs 4 in. by 3½ in. by 7/16 in. and a top cover plate 21 in. wide by ¼ in. thick. The crossbearers are ¼-in. pressed steel diaphragms 16⅛ in. deep at the center, reinforced at the bottom by a 6-in. by ⅜-in. cover plate which passes through the web of the center sill. The body bolsters are of the same general construction as those used on the other gondola cars, having ⅝-in. top and bottom cover plates. The bottom side angle used in this design is 4 in. by 3½ in. by ½ in., and the same bulb angle is used at the top of the sides. The side, end and door sheets of the car are ¼ in. thick. There are 12 pressed steel stakes on each side of the car made from 5/16-in. plate.

Box Cars

The designs include a 40-ton steel underframe, double sheathed box car and a 40- and 50-ton single sheathed box car, and are illustrated in Figs. 6, 7, 8, 9, 10 and 11. The 40- and 50-ton steel frame cars have identical body construction, the only difference being in the trucks. There are certain details in the construction of the bodies of the double-sheathed and single-sheathed cars which are the same in both. Steel ends are specified for all box cars, and these may be either of the Murphy, vertically corrugated or the plain steel end type. Outside steel roofs are required, which may be either of the Murphy, Hutchins or Chicago-Cleveland type. In many cases the same steel pressings and commercial shapes are common to both types of cars. A brief description of these cars follows:

Forty-Ton Double Sheathed Box Car.—This design has an estimated weight of 44,000 lb. The underframe has a center sill of the fish-belly type, which is 2 ft. 2 in. deep at the center. It is made up of 5/16-in. web plates, with a top 4-in. by 3½-in. by 5/16-in. angle and a bottom 4-in. by 3½-in. by ⅜-in. angle on the outside and a 4-in. by 3½-in. by 7/16-in. angle on the inside of the web plate. There is a top cover plate 20½ in. wide by ¼ in. thick. There are two crossbearers made up of ¼-in. pressed steel diaphragms, having a top cover plate 6 in. by 7/16 in. and a bottom cover plate which extends through the webs of the sills, of 6-in. by ⅜-in. plate. The body bolsters are built up of ¼-in. pressed steel diaphragms and have top and bottom cover plates 14 in. by ½ in., which extend almost out to the side sills. The side and end sills are 9-in. shipbuilding channels, which are used so commonly throughout the design of these cars. The end sills are made from the standard 9-in. shipbuilding channels. There is a diagonal brace extending from the junction of the center sill with the body bolster to the corners made of 5/16-in. plate. A 6-in. by ¼-in. plate extends between the body bolsters and the end sill midway between the center sills and the side sills to further reinforce the ends. These are riveted to the diagonal brace mentioned above.

The superstructure of the car is of standard double sheathed construction, with 3½-in. by 3-in. posts and 5-in. by 3-in. braces. The side posts are reinforced by the 3-in. 4-lb. channel, which fits over the post, being bolted to it, and by a ⅝-in. tie rod which extends between the side plate and the side sill. The last intermediate side post is tied to the corner post by ⅝-in. rods at the upper belt rail. The brace and side post pocket casting of the same post is tied to the end of the car by a diagonal tie rod 1⅛ in. in diameter. The side plates are 6¾ in. by 3½ in.

The doors are made up of 7½-in. by 13/16-in. transverse

and vertical framing, with 5½-in. by 13/16-in. diagonal braces. They are of the underhung type. A 1½-in. by 1½-in. by 13/16-in. angle is placed on the outside for additional stiffness.

Forty and Fifty-Ton Single Sheathed Box Cars.—These cars weigh 44,000 lb., the same as the double sheathed car. In common with the double sheathed car, they have the underhung door and the same draft sills. The center sills are 12-in. ship-building channels. These care have two cross-bearers made up of ¼-in. pressed steel diaphragms with a 6-in. by ⅜-in. top cover plate and a 6-in. by 7/16-in. bottom cover plate. The bolsters are made up of 15/16-in. pressed steel diaphragms with a 14-in. by ⅝-in. top and bottom cover plate. The side sills and end sills are 9-in. shipbuilding channels.

The side posts and braces are of pressed steel U-sections,

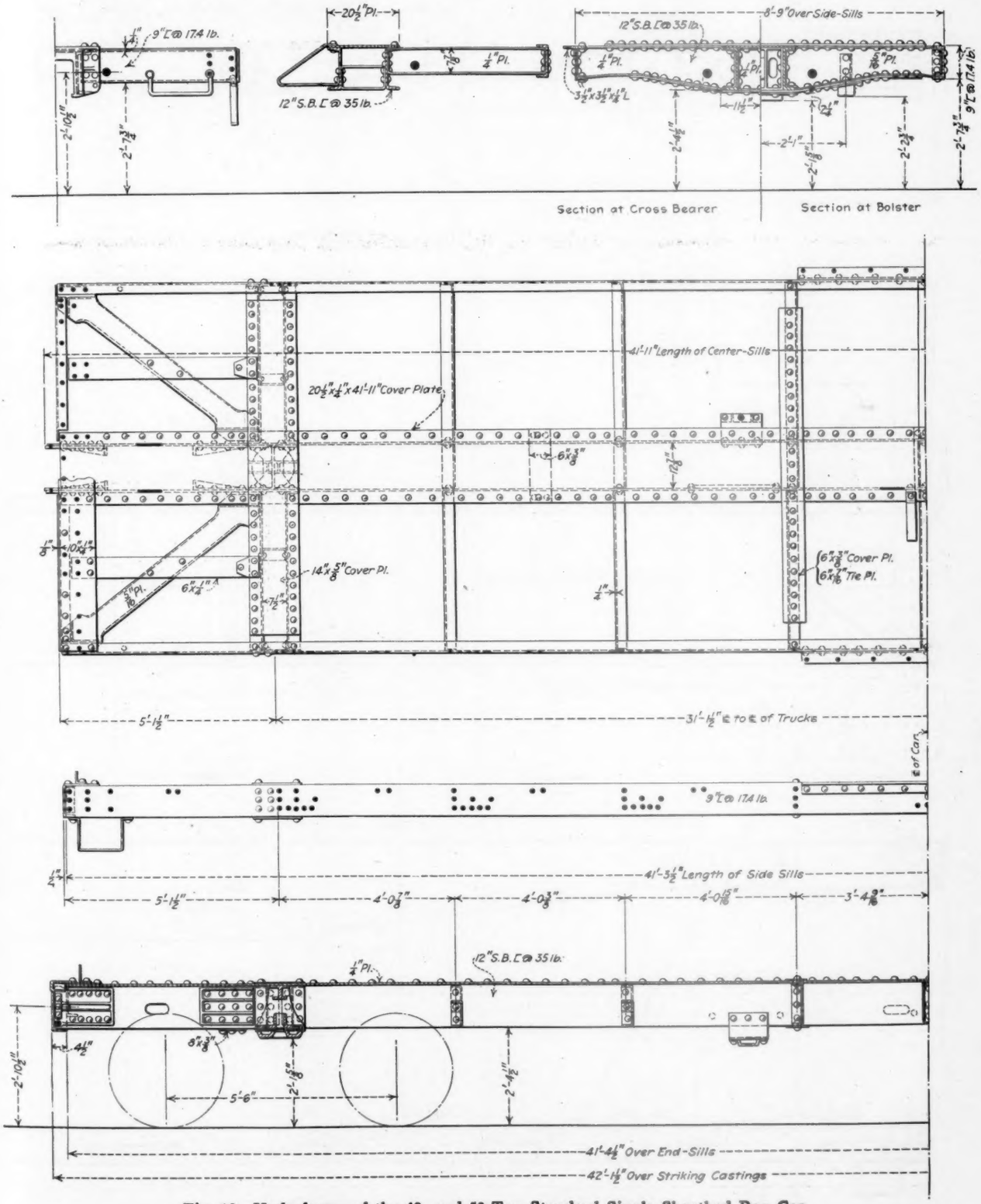

Section at Cross Bearer
Section at Bolster
41'-11" Length of Center-Sills
20½"x¼"x41'-11" Cover Plate
14"x⅝" Cover Pl.
6"x⅜" Cover Pl.
6"x7/16" Tie Pl.
31'-1½" ℄ to ℄ of Trucks
9" I @ 17.4 lb.
41'-5½" Length of Side Sills
12" S.B. C @ 35 lb.
41'-4½" Over End-Sills
42'-1½" Over Striking Castings

Fig. 10—Underframe of the 40- and 50-Ton Standard Single Sheathed Box Car

made from ¼-in. plate. These are riveted to the side sill and to a 6-in. by 3½-in. by ⅜-in. angle, which forms the side plate. The sheathing used for these cars is 5-in. wide by 1½ in. thick. The roof construction is the same in general as that of the double sheathed car. The carlines are made of 5/32-in. open hearth steel pressed to a U-shape, 4½ in. deep.

Hopper Cars

Two designs of all-steel hopper cars have been made, one of 55 tons capacity, which has a double hopper bottom, and one of 70 tons capacity, having a triple hopper bottom. The 55-ton car is to be carried on the standard 50-ton truck, which is designed to carry an overload equivalent to this rating. The elevation and sections of the 55-ton car are shown in

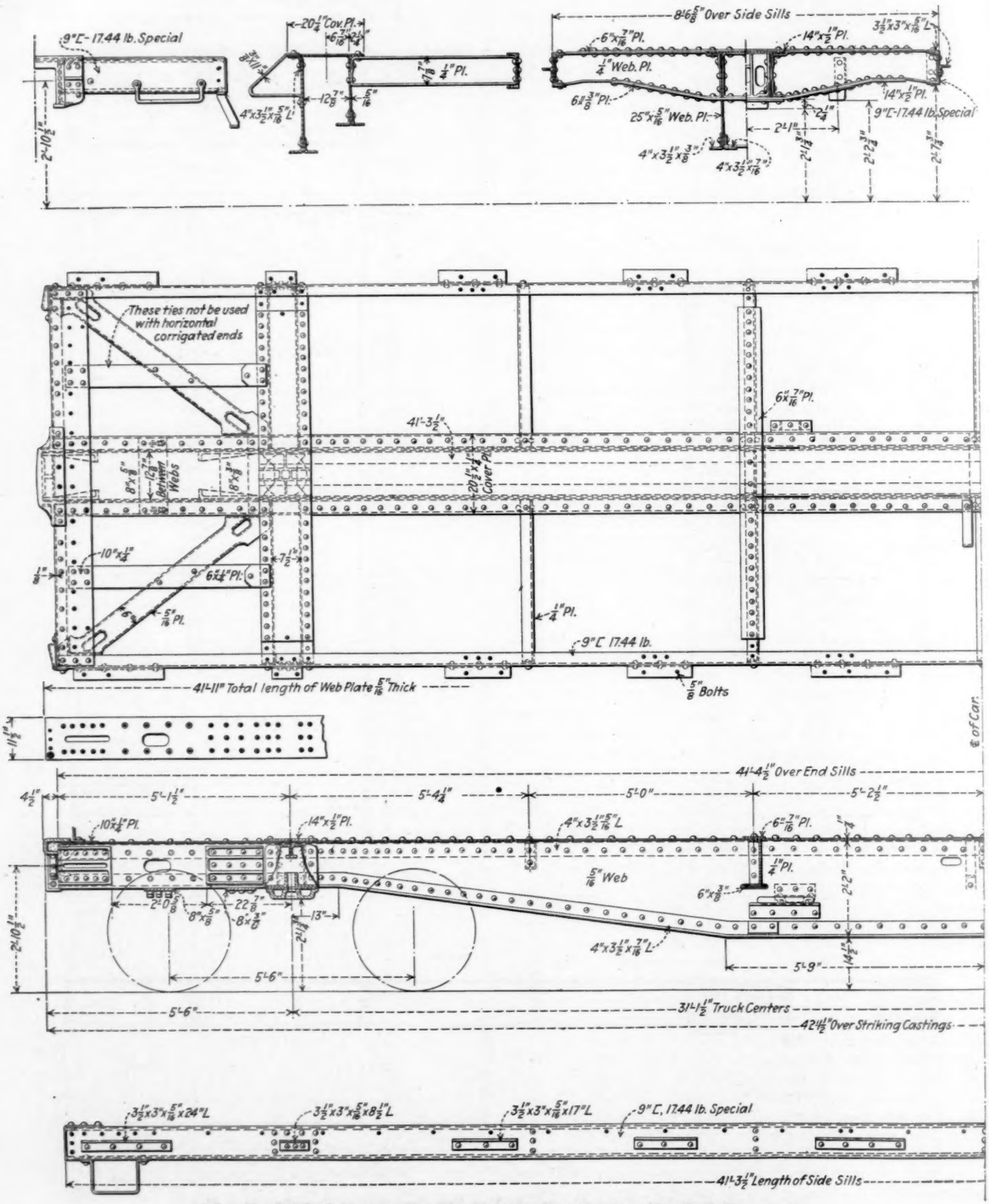


Fig. 11—Underframe of the Standard 40-Ton Double Sheathed Box Car

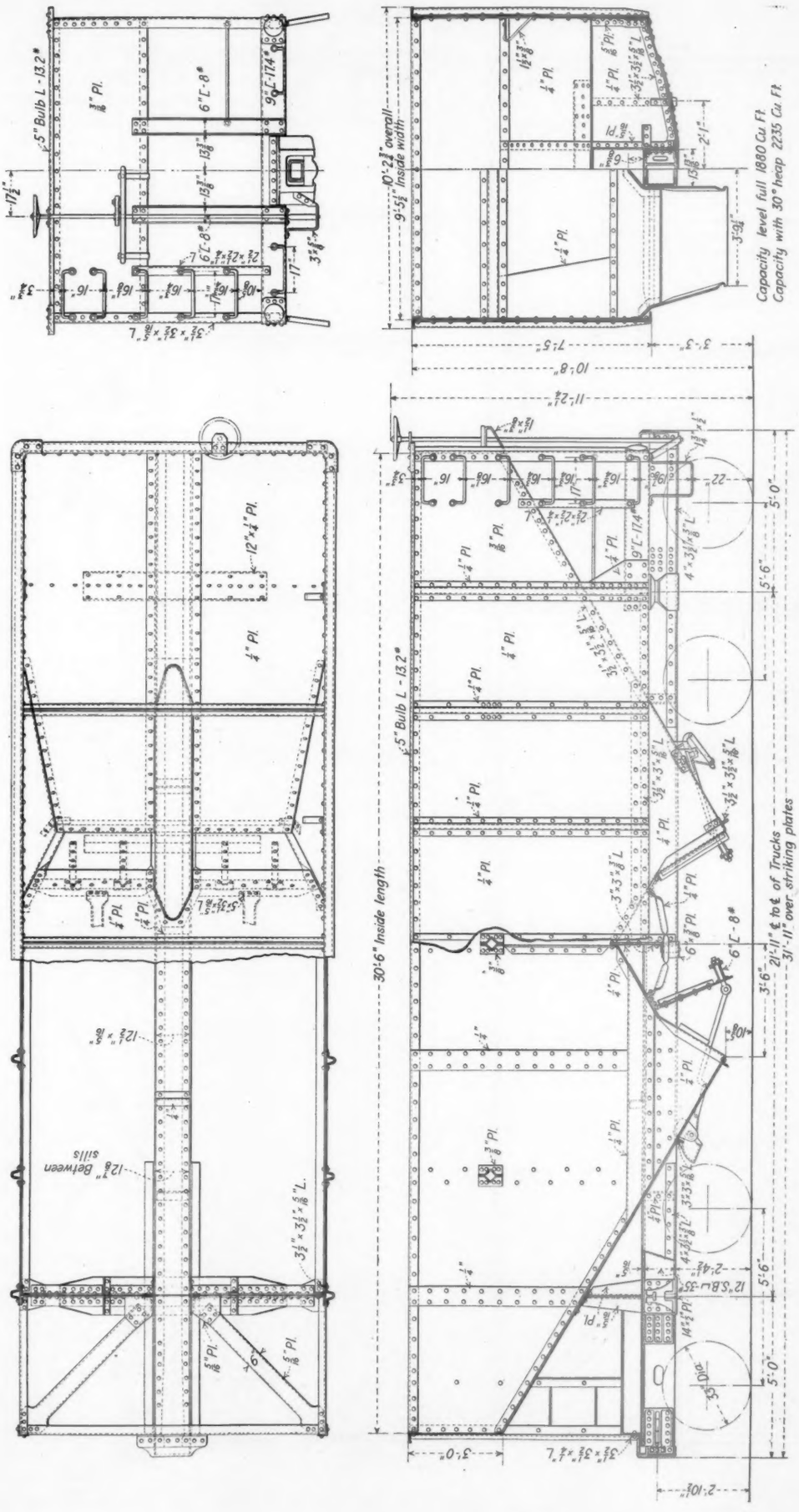

Capacity level full 1880 Cu Ft.
Capacity with 30° heap 2235 Cu Ft.
10'-2½" overall
9'-5½" Inside width
30'-6" Inside length
31'-11" c to c of Trucks
21'-11" over striking plates
5" Bulb L - 13.2#
12" Between sills

Fig. 12—General Plan of the Standard 55-Ton Hopper Car

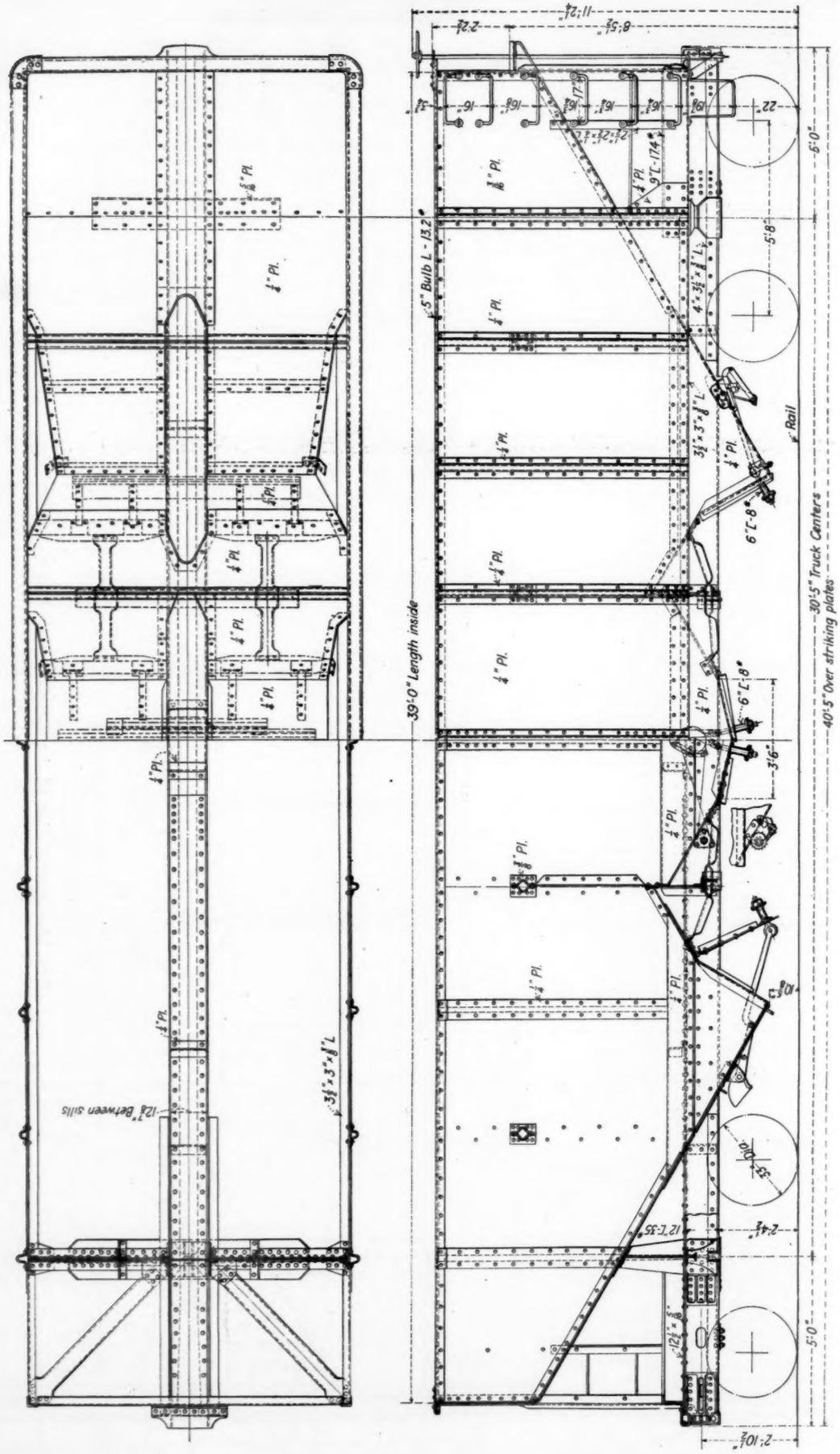


Fig. 13—General Plan for the Standard 70-Ton Hopper Car

Fig. 12, and those for the 70-ton car are shown in Figs. 13 and 14. As in the gondolas, there are many parts of these cars, particularly in the door operating mechanism, that are common to both. A brief description of these designs follows:

Fifty-five-Ton Hopper.—This car has an estimated weight of 40,000 lb. It has the 12-in. channel center sills, which are reinforced at the ends by a 4-in. by 3½-in. by ⅜-in. angle. The center sills cover plate is 12½ in. wide by 15/16 in. thick. The body bolster is built up of a 5/16-in. plate, with reinforcing plates ⅜-in. thick and bottom angles 3½-in. by 3½-in. by ⅜ in. There is a bottom cover plate 14 in. wide of ½-in. plate. The end sills are 9-in. shipbuilding channels. The standard 5-in. bulb angle is used at the top of the sides and ends. There are six side stakes of U-section pressed from ¼-in. plate. The side, end and floor plates are ¼ in. thick, with the exception of the last panel at the sides and the top panel on the ends, which is 3/16 in. thick. Two 6-in., 8-lb. channels form the end posts.

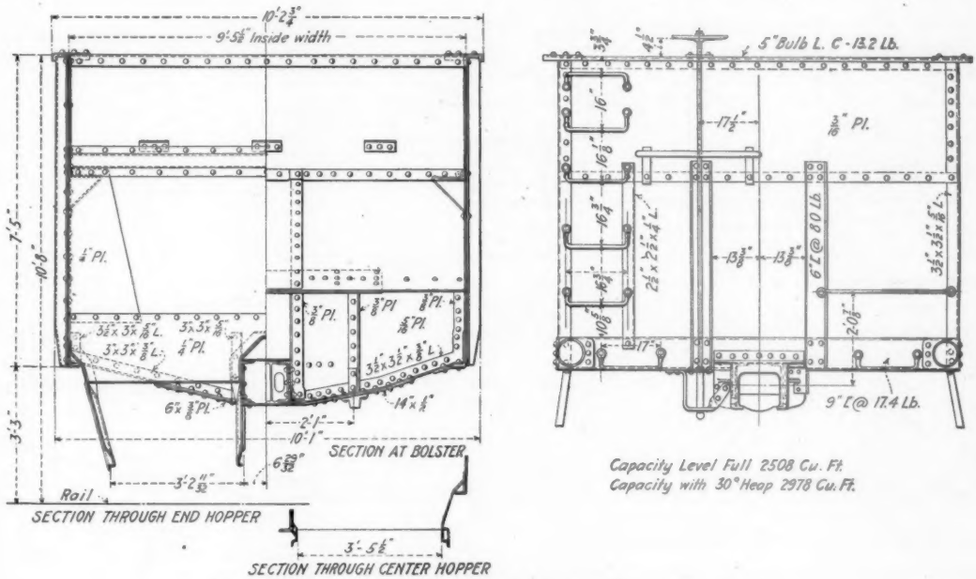

9'-5⅝" Inside width
5" Bulb L. C - 13.2 Lb.
SECTION AT BOLSTER
SECTION THROUGH END HOPPER
SECTION THROUGH CENTER HOPPER
9" [@ 17.4 Lb.
Capacity Level Full 2508 Cu. Ft.
Capacity with 30° Heap 2978 Cu. Ft.

Fig. 14—Sections of the Standard 70-Ton Hopper Car

Seventy-Ton Hopper Car.—This car has an estimated

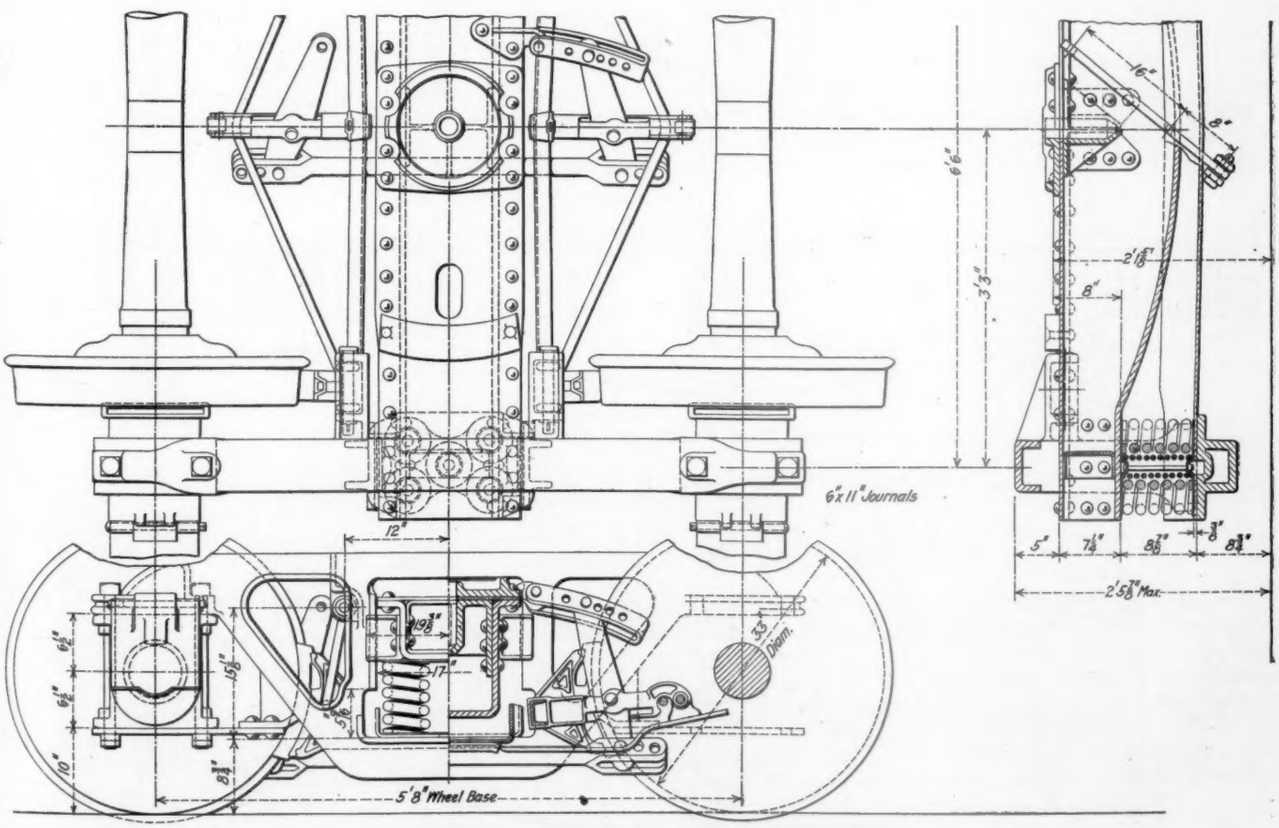


Fig. 15—General Plan of the Standard 70-Ton Truck

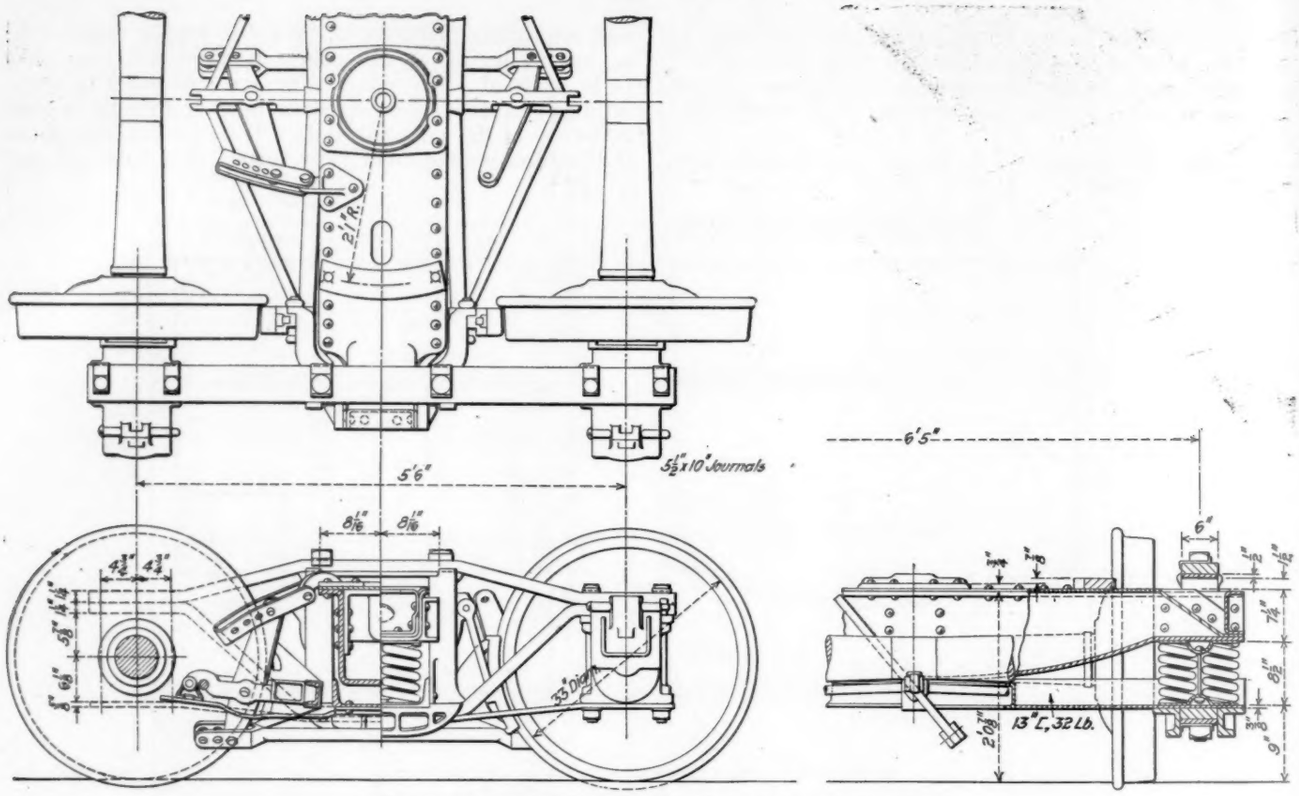


Fig. 16—General Plan of the Standard 50-Ton Truck

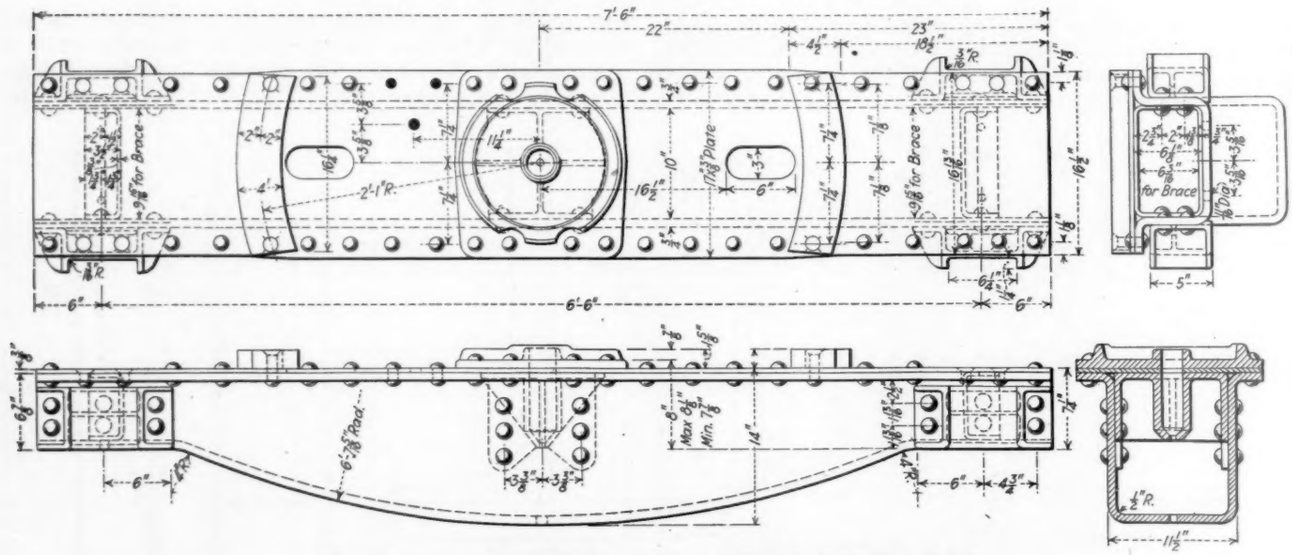


Fig. 17—Pressed Steel Bolster for the Standard 70-Ton Truck

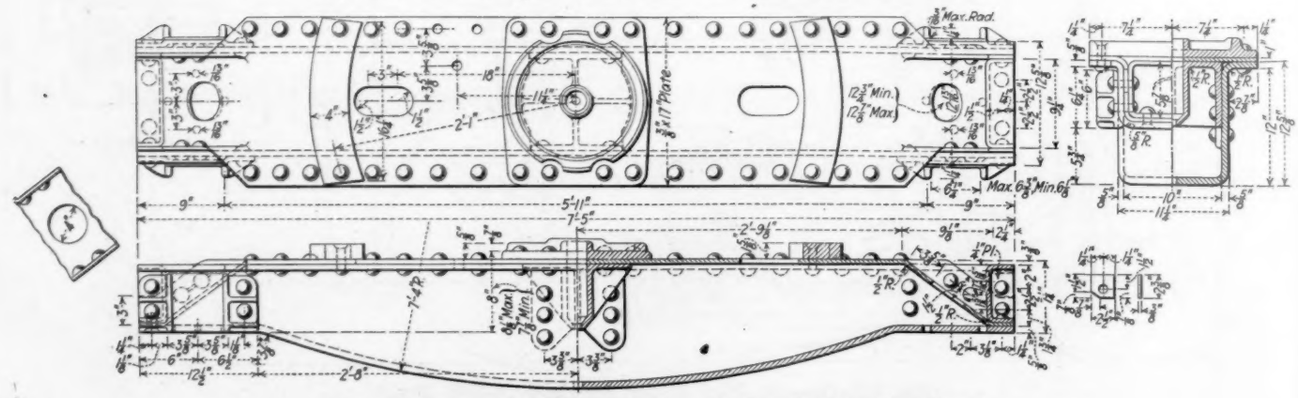


Fig. 18—Pressed Steel Bolster for the Standard 50-Ton Truck

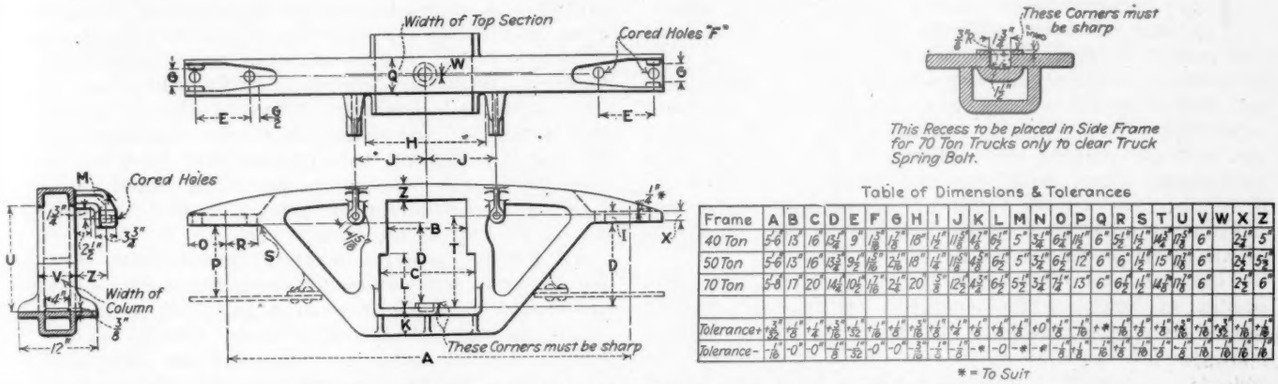
weight of 49,500 lb. The center sill and plates are very similar to the 55-ton car. The body bolsters are made up of 5/16 web plates with ⅜-in. reinforcing plates, 3½-in. by 3½-in. by ⅜-in. bottom angles and a 14-in. by ½-in. bottom cover plate. The side stakes are pressed from ¼-in. plate, and the end posts are 6-in., 8-lb. channels with 3½-in. by 3½-in. by 5/16-in. angle corner posts. The floor construction is in general common to both cars.

Trucks

There have been three general designs of trucks developed for use with the standard car. They have capacities of 40, 50 and 70 tons. Illustrations showing the designs will be found in Figs. 15, 16, 17, 18, 19 and 20. Both the 40- and 70-ton trucks are required to carry an overload of 10 per cent above the rated capacity, while the 50-ton truck is designed to carry a load of 121,000 lb., in addition to the light weight of the car body, thus making it available for use under the 50-ton cars.

There is a marked similarity between the 40- and 50-ton trucks, and for that reason but one has been shown in the illustrations. The 40-ton truck calls for arch bars of 1⅛-in. material, while the 50-ton truck calls for arch bars of 1¼-in. material. The 70-ton truck is shown with the cast steel side frame, as the arch bar type is not permitted to be used on this truck. The limiting dimensions which all side frames must meet is shown in Fig. 19.

The pressed steel bolsters for the 40- and 50-ton trucks are of similar design, the chief difference being in the weight of material used. The 50-ton bolster design is shown in Fig. 16. The bottom plate is ⅝ in. thick in the 50-ton and ½ in. thick in the 40-ton. The 70-ton truck bolster, which is shown in Fig. 17, it will be noted, is of somewhat different design. Cast steel and built-up bolsters may be used instead of the pressed steel bolster. All of the brake beams must conform to the limiting outline shown in Fig. 20.


Width of Top Section
Cored Holes "F"
These Corners must be sharp
This Recess to be placed in Side Frame for 70 Ton Trucks only to clear Truck Spring Bolt.
Cored Holes
Width of Column
These Corners must be sharp
Table of Dimensions & Tolerances
* = To Suit

Frame	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Z
40 Ton	5'-6"	13"	16"	13¼"	9"	1⅜"	1½"	18"	1½"	11⅛"	4½"	6½"	5"	3¼"	6¼"	1⅛"	6"	5¼"	1½"	14⅜"	17⅜"	6"		2½"	5"
50 Ton	5'-6"	15"	16"	13¾"	9½"	1⅝"	2⅛"	18"	1¼"	11⅝"	4⅝"	6½"	5"	3½"	6½"	12"	6"	6"	1½"	15"	17⅜"	6"		2½"	5½"
70 Ton	5'-8"	17"	20"	14⅛"	10½"	1⅞"	2½"	20"	3⅜"	12½"	4¾"	6½"	5½"	3¼"	7¼"	13"	6"	6½"	1½"	14⅜"	17⅜"	6"		2½"	6"
Tolerance +	⅜"	⅛"	¼"	1/16"	1/32"	1/16"	⅛"	1/16"	⅛"	¼"	⅛"	⅛"	⅛"	⅛"	+0	⅛"	1/16"	*	1/16"	⅛"	⅛"	1/16"	1/32"	1/16"	1/16"
Tolerance -	1/16"	0"	0"	1/16"	1/32"	0"	0"	0"	1/16"	1/32"	1/32"	*	*	*	-0	*	*	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"

Fig. 19—Limiting Dimensions for the Cast Steel Truck Side Frames

In general, the trucks have been so designed that a number of the parts are made similar to all. For instance, the truck center plate, the suspension spring clamp, truck center plate support and other minor details are the same.

THE TIME-TABLES IN BELGIUM and in the occupied territory of France present a sorry picture, says a correspondent in the London Times. Except for the military trains there are but few ordinary trains, and these are stopping (accommodation) trains. The journey from Ostend to Brussels takes about five hours instead of one hour and three-quarters as in peace time. Moreover, all sorts of restrictions are in force, and no journey can be made without a permit from the military authorities.

MODERN INDUSTRIES IN CHINA.—With regard to the question of newer industries in China, modern shipbuilding and the other departments of mechanical engineering have received very little attention. There are 23 shipbuilding and engineering works on the coast, of which three only are Chinese property. Of all these works, only three build ships, the remainder confining themselves to repairs and general engineering work. There are about 12 railway works in the country, but with the exception of those belonging to the Peking-Mukden and Shanghai-Nanking railways, the shops are employed on general maintenance work, and very little outside work is done. All machinery used is imported, as is also all steel for structural purposes. This market was in the hands of Great Britain and Germany before the war, the latter dealing principally in electrical machinery. In this department Germany had attained a paramount position, largely owing to the long credit system and curious notions of commercial morality, also by the employment of men with a knowledge of the country, who did not stick to the treaty ports, but went to look for orders.

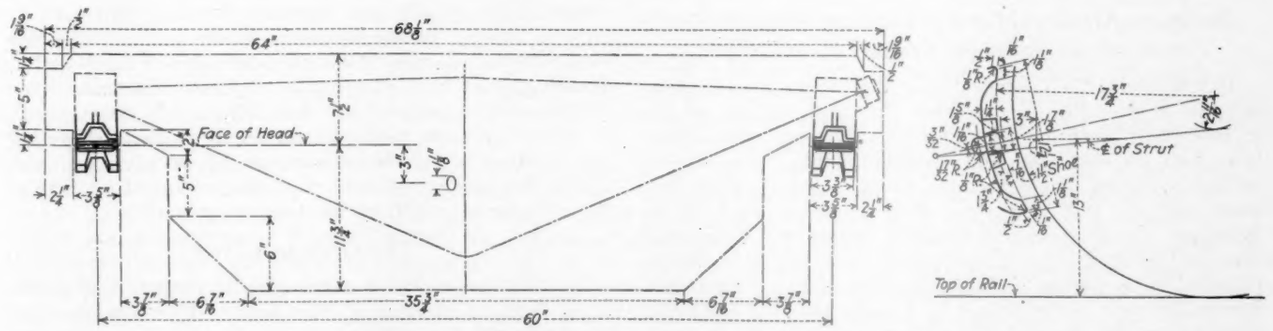


Fig. 20—Limiting Outline for the Standard Brake Beams

The Powerful Foreign Trade Combinations of Europe

We Must Form Combines of Equal Fighting Power to Maintain Our Export Trade After the War

By P. Harvey Middleton

Executive Assistant, Railway Business Association

"IF YOU CAN IMAGINE a squad of recruits, responding patriotically to their country's call for foreign service, paying for their equipment and training out of their own pockets, studying their equipment without any aid from the government except a correspondence course of instruction, and then, without any company or battalion drill, being sent to the front with the plaudits and best wishes of their country, and with the warning that if they ever drill or fight, as a co-ordinated army, or in any way, except as unrelated individuals, they will be liable to court-martial and public punishment upon their return, you have a very good idea of what your predicament is now."

That was how a New York lawyer described the present position of American exporters under the existing anti-trust laws. He might have gone still further with his striking analogy, and depicted what actually happens when our soldier of commerce practises the role of individual fighter against the "mass formations" of Europe. One man with a machine gun in No Man's Land can tear tragic gaps in the onrushing hordes, but one American railway supply manufacturer competing in foreign markets with a German cartel or a French comptoir has as much chance of capturing a profitable order as a snowball has of remaining five minutes in the ultimate destination of the Kaiser.

Half the trade of the world has, during the war, been cut loose from its Old World moorings, and has drifted to the new. Do you think that the eighteen billions of dollars invested by the British in foreign countries, the eight billions of dollars of French foreign investments, or the nine billions of Germany, will let it remain here without a mighty struggle? Not on your life. Signs multiply that the bitterest commercial fight in the history of the world will follow the war, and if Americans are to have a sporting chance they will need all the powers provided in the Webb-Pomerene bill permitting combinations in export trade—a measure which may be signed by President Wilson before this goes to press.

Germany Already Making Plans to Regain Her Foreign Trade

If you think for a moment that the Germans will be so crippled at the close of hostilities that they will be unable to turn their attention to reknitting the rents which have been torn by American and British manufacturers in the foreign trade net of the German Empire, ponder for a moment over the fact that there has just been launched in Hamburg the Corporation for the Promotion of German Foreign Trade, with an initial capital of $5,000,000, for the purpose of exploring foreign markets and building new foreign railways. The Kolnische Zeitung gives the following summary of this Association's plans:

"This great new concern is to occupy itself exclusively with the development of German overseas trade. Important export houses, manufacturing corporations, shipping lines, and banks in Hamburg and all the other commercial and industrial centres of the Empire will be interested. The company is to serve as an active and efficient axis, round which all Germany's efforts to reknit her old relations and establish new ones will revolve. It is not to be a bank in the ordinary sense or an export bank. It will, on the contrary, refrain from banking operations of the usual sort. It will act primarily as a syndicate for exploring foreign markets, and when advantageous opportunities present themselves will fulfill the functions of a financial promoting company. It will take up, on behalf of all German interests concerned, promising projects abroad, such as waterworks construction and operation, railway building, harbor and dock works, and transactions of similar magnitude. These the company will not only promote and carry out, but if necessary provide the money for. The initial capital of $5,000,000 is wholly provisional. It will be multiplied many times over as required."

But perhaps you are deluding yourself with the belief that Germany won't have any ships, that we have captured all their big ones, and that embargoes have prevented their getting the materials to replace them. Wrong again. The Berlin Tageblatt publishes details of the development of the German shipbuilding yards, showing that in 1916 and 1917 all the private yards, except some of the largest, like the Vulkan concern, increased their capital. Blohm & Voss of Hamburg raised their capital from $3,000,000 to $5,000,000, and the Howaldt yards at Kiel raised theirs from $1,000,000 to $2,500,000. In other respects the German concerns have anticipated the needs for the reconstruction of the German merchant marine. The Hamburg American Line and the Allgemeine Elektricitats Gesellschaft have founded the new Hamburg Shipbuilding Company, and among the new establishments and projects are two at Lubeck, one at Hamburg, several at Stettin and Emden, and one at Tonning.

At the Vulkan yards near Bremen the Hamburg American line recently launched a 16,000-ton steel vessel, christened Rhineland, which is the largest ship ever laid down in Germany for purely freight carrying purposes. The German press acclaims the launching not only as a sign of Germany's determination to make her presence felt in world trade after the war, but because, despite the strain imposed on her industries for purely war purposes, her shipyards are able to turn out this "record-breaking" merchantman. The Hamburg American Line's 50,000-ton sister ship of the Vaterland, the Bismarck, has been completed, and this same line is credited with having at least one other giant and a flock of two-score or more medium and small-calibred ships built and building. The North German Lloyd has completed a 35,000-ton express steamer, the Hindenburg, and is pushing work on an ambitious building program.

The German Cartel

Do you know what a cartel is? It is the application of brute force to commercial enterprise. The concerns entering it renounce a part of their industrial and commercial autonomy in order to secure the advantages of cohesion. The cartel differs from the American trust in that it allows the individual enterprises attached to it to remain independent, and restricts itself to enforcing certain controlling principles in regard to production, prices, and competition. It aims at removing conflicts and losses resulting from ruinous competition and lack of organization. A uniform system of cost accounting and standardization of products eliminates waste. Only the strongest cartels undertake to influence foreign business, maintaining a firm export policy and exporting at

lower prices than are charged home customers, finding foreign markets an excellent outlet for excess production.

The Stahlwerksverband or steel syndicate is, next to the coal syndicate, the leading German cartel. It monopolizes the production and distribution of steel in Germany. At the time of its foundation in 1904 it had a total output of 7,900,000 metric tons. Its products include rails, ties, fishplates, spikes, bedplates, structural steel, railroad axles, and steel forgings. The administration of the syndicate is vested in a general assembly of all the members, a supervisory council, and managing directors. The stock is exclusively in the hands of the owners of the steel works, and may be transferred only with the consent of the general assembly. Each member has one vote in the assembly for every 10,000 tons quota of production.

The Germans, through the Stahlwerksverband, are formidable competitors, not only because of the advantages of export bounties and freight rebates, but because they keep in close touch with the requirements of foreign markets through effective and expensive representation on the ground, and because the syndicate backs up the credits granted by individual manufacturers to secure initial business. This cartel believes in dumping in order to keep its plants working without interruption at maximum capacity. It controls over 90 per cent of the production in Germany of steel products. Before the war this cartel had an annual turnover of $238,000,000, and held down English steel production by delivering steel billets in England at lower prices than the English could produce steel. In 1914 steel bars were offered in New Orleans at $6 per ton below the lowest figure at which an American firm could manufacture them.

This steel cartel controls the sale of its products by merchants in Germany, Austria, Switzerland, Belgium, and France. It has been aptly termed a giant octopus, whose eyes are at Bremen, at Dusseldorf and at Berlin, with tentacles, armed with innumerable suckers, reaching out to Asia Minor, by way of Constantinople, threatening London through Rotterdam and Antwerp, stretching across Switzerland into Italy, extending over the Atlantic and South America, embracing Chile, spreading out over Brazil, Argentina, and Mexico, and in another direction to the Indian Ocean and the China seas, and fixing themselves firmly on the Far Eastern strands.

There are other German organizations for securing foreign trade in railway supplies. The Orenstein Koppel Aktien Gesellschaft represents a syndicate of producers of Decauville (narrow gage) railway materials. This combination has practically stamped out the French and Belgian competition which formerly controlled the supply to Turkey. The Verband Deutscher Waggon Fabrikanten controls 90 per cent of the total German production of railway cars.

The Association of German Machine Tool Manufacturers has made a study of export trade with special reference to the competition of American manufacturers, whom they have actively opposed. The German Electrical Manufacturers Association has made a special study of tariffs and commercial treaties, and secured many changes in both for the benefit of German exporters of electrical equipment. It keeps its members informed of new street railway and power plant projects in other countries, and suggests valuable foreign connections. German business men have realized the great importance of commercial treaties and there is a special organization for this particular purpose—the Commercial Treaty Association (Handelsvertragsverein) with 9,000 members and 150 affiliated associations. Electrical equipment is controlled by two powerful syndicates, the Allgemeine Elektricitats Gesellschaft, and the Siemens-Schukert.

Great Britain's Commercial Counteroffensive

The British are preparing a commercial counteroffensive which will make things interesting for the Germans in the foreign field. They have formed the British Trade Corporation, with a capital of $50,000,000, which will devote its energies to expanding the trade of the British Empire in every part of the world, and will grant loans to exporters with more distant maturities than the banks can offer. The British Manufacturers Corporation was also formed recently with a thousand members, each subscribing from $500 to $1,000 annually, and will employ high grade men as resident representatives in all foreign countries, whose business it will be to find and appoint local selling agents for individual firms, to look out for new trade openings, to report on the general reputation of prospective customers, and generally superintend the business interests of all firms in the organization. Then there is the newly created British Commercial Intelligence Department, with 738 officials in the London office and a multitude of assistants in the principal centres of the world. All this army of officials is in constant contact with the British Government, and all are contributing to make British commerce a greater world power than ever.

Here, too, we find special organizations of railway supply manufacturers, such as the North British Locomotive Company, Ltd., capitalized at $9,000,000, a combination of eight plants which handles nearly the whole private production of British locomotives. As the British railway companies build and repair most of their own rolling stock, this company is engaged almost entirely in export trade. Another amalgamation is the Metropolitan Carriage Wagon & Finance Company, a combine of five companies making rolling stock for export. This company also has a capital of $9,000,000, and owns a blast furnace and steel smelting concern, enabling the company to make its own axles and tires. There is known to be a very close and monopolistic combination among British firms manufacturing cables for street railways, and other British railway equipment industries are understood to have a complete understanding as to many important trade policies. Practically all the rail manufacturers of Great Britain belong to the British Rail Makers' Association, which enjoys almost a monopoly in colonial markets and in those countries in which a great deal of railway construction is carried out with British capital.

The French Comptoirs

In France there are various "comptoirs" or central selling organizations, such as the Comptoir for the Exportation of Metallurgical Products, which exports rails and their accessories, ties, girders, and channels. All business is secured by means of established agencies in various cities, such as Buenos Aires and Rio de Janeiro. Each agency is placed in charge of a large exhibit of samples, consisting of cross section cuttings of various sizes of rails, beams and channels, mounted on a wooden frame, and each agency has advertising matter for distribution at the expense of the comptoir. The sales are made by the comptoir outright to the agency, which finds the customers and carries the accounts in the district allotted to it. Business is conducted on a purely commission basis. The comptoir takes all the export output of its members for sale abroad and reimburses them when payment has been made by the customer. Brazil, Argentina, and China have been the principal fields of operation of this combine, and in six years the exports of the articles in which it is interested increased from 40,000 to 200,000 tons. There are also axle and car spring comptoirs.

There is a French association of manufacturers of locomotives which fixes the price on the various types, orders being apportioned among all the manufacturers in proportion to their output. The association has had a successful career for ten years. There is also a railway materials syndicate which is one of the principal constituents of the central organization of the metal industries, Union des Industries Metallurgiques et Minieres.

In Egypt, China and Japan export combinations of Ger-

man and British engineering concerns have fought each other tooth and nail for the profitable business of those countries—how profitable may be gathered from the fact that in three years engineering contracts valued at $450,000,000 were obtained in the Chinese market. The report of the Federal Trade Commission on Co-operation in American Export Trade, published in 1916, points out that in the Chinese market it would be difficult for a single firm manufacturing machinery or railway supplies to represent itself. It states that one German organization embraced 47 engineering firms, besides Krupps, two shipping houses, one marine insurance company, one life insurance company, and one fire and building insurance firm. It had branches with one or more Chinese-speaking Germans in charge at all important Chinese cities.

The Enormous Markets in China

While American and British competitors were endeavoring to sell their products individually the Germans began by saving the Chinese trouble. Thus, if there was a mining venture, the representative of the allied German manufacturers would go to the local governors or parties interested and offer to take the whole job, i.e. sink the shafts, develop the mines, put in all the equipment, build the railways or boat lines, erect power plants and equip them, put up workmen's dwellings and finance the undertaking. Such an organization could sell a Chinaman a five-cent handsaw or develop an entire province.

In 1915 the Anglo-Chinese Engineers' Association was formed for the purpose of securing an outlet for British machinery and engineering supplies of all descriptions. It is strictly a non-competing group of 75 concerns making machinery, railway supplies, engineering material and tools. Each of these firms was required to take stock in the combine, the value of which was determined in each instance by the ratio that the line bore to the whole of the imports of machinery and engineering supplies to China in any one average year. Each of the firms was bound to an agreement to work in unison with other members of the combine in the case of contracts for combined plant, and no firm was accepted for more than two lines of its manufactures, and no two firms in the combination were accepted for similar plants. For instance, if A. B. is represented by the combine for textile machinery, no other house will be represented for this line. The organization has branch houses in charge of Chinese-speaking European assistants at selected ports and industrial centres, with a managing director in Peking. In large cities such as Peking, Hankow and Canton, there are competent mechanical engineers with Chinese experience, while the selling staff includes men with intimate knowledge of the localities in which they are used.

The United States Must Make Similar Plans

American manufacturers and exporters of blast furnace and rolling mill products have expressed themselves to the Federal Trade Commission generally in favor of some further measure of co-operation among themselves for the export trade than at present exists. Three of the largest of such manufacturers have stated their conviction that their export trade would be increased if they could join with all, or a large part, of the other independent producers in a company organized along similar lines to those of the United States Steel Products Company, and empowered to fix prices. Another concern which favors a voluntary export combination or association in its line advocated that activities should be confined strictly to joint selling.

Among the advantages which were hoped from such increased co-operation is a broader market, which would stabilize prices, keep the furnaces and mills in more continuous operation, and by running the plants at capacity lessen overhead expenses. Lower selling costs could also be expected through the greater economies resulting from a common selling organization. By such an organization the smaller producers in the United States believe they could materially extend their export trade.

At the Fourth National Foreign Trade Convention, held in Pittsburgh in January, 1917, several methods were suggested for co-operation in foreign trade by a committee which included E. P. Thomas, president of the United States Steel Products Company, and Charles M. Muchnic, vice-president of the American Locomotive Sales Corporation. These plans were predicated on the passing of the Webb bill. One plan was for a group of large manufacturers closely identified making kindred but generally non-competing products. A general fund was to be formed and shares issued to each manufacturer in proportion to his contribution. There was to be a selling organization which would consolidate all existing foreign agencies of the members and would assume credit risks. Such an organization could secure ocean transportation to best advantage and undertake with the aid of experts all the miscellaneous details connected with export business.

Another plan was for five or ten concerns making allied products to get together, each company subscribing from $2,000 to $4,000 for initial expenses. A manager would be hired who would familiarize himself with territories and decide upon the best markets in which to commence operations. Each concern would consign its goods at lowest export prices, payment to be made as received from the purchaser. After three or four years the capital could be increased and the consignment accounts cut out. Another plan was for a number of manufacturers to divide the expense of sending a competent man to investigate certain markets and then either to raise capital among themselves or interest a responsible commission house with foreign connections to put in a local stock of goods.

At the Fifth National Foreign Trade Convention to be held in Cincinnati on April 18, 19 and 20, the subject of combinations in foreign trade will be again discussed, one of the speakers being George H. Charls, vice-president of the American Rolling Mill Company, of Middletown, Ohio, who has recently returned from a trip to England and South America.

"There is only one avenue to success," says Mr. Charls, "and that lies in co-operation; if possible, the forming of syndicates equally as strong and well organized as those of our foreign competitors. Under present conditions, if 20 steel companies are persuaded to go after export business in Brazil, at least 20 men must be sent to that country. If 20 countries offer a field, at least 400 men must be sent abroad, and they will have to compete with one another. If 20 steel companies co-operate under the provisions of the Webb bill, one man can accomplish the result of 20. In the name of pure economy and self-defence we cannot safely pursue any other course. The same plan will permit the joint co-operative advertising of all members."

It has been suggested by an American consul that an association of American manufacturers of non-competing articles could profitably form an organization, dividing the expenses and being represented in Shanghai, Hankow and possibly other places in China. As a list of manufacturers upon which to form the basis he suggests the following: Railway locomotives, railway rolling stock, electrical supplies, flour-mill machinery, oil-mill machinery, coal-mining machinery, iron-mining machinery, motor cars, motor engines, structural steel material, heating plants, plumbing, arsenal equipment, rolling-mill machinery, cotton-mill machinery, and desiccated-egg mills.

The cost of maintaining offices in Hankow—the Pittsburgh of China—for such an association of manufacturers would be something like the following: Local manager, $5,000; office rent, $1,440; clerical and Chinese staff, $4,000; other office expenditure, $400. The total expense might be $1,000 per month. An office could be run on less, but this is con-

sidered conservative for efficiency. The maintenance of an office in Shanghai would cost more. But even should the cost be double this amount, it will fall very lightly upon each individual member of the association of manufacturers.

There are many ways in which money might be lent with perfect safety to assist in developing Chinese industry and extending American sales. An association of manufacturers on the spot would be able to determine which would be safe and which would best develop the American export trade. The first year would not be profitable, but this association would build up a reputation for American interests and would receive many inquiries that at present do not reach American manufacturers or exporters.

We Cannot Sit by Placidly

One thing is certain: we cannot sit by placidly while our industrial strongholds are assaulted by the long-range guns of London, Paris and Berlin. The European international trader will "come back" after the war with a wallop which will be felt from Berlin to Peking, from London to Cairo, and from Paris to Timbuctoo. Every market between the Mexican border and the Land of Fire will be invaded. Well drilled emissaries speaking the languages of the countries to which they are accredited will be sent to secure the highly remunerative engineering contracts of the Far East. The European will "dig in" for a throat-cutting trade war, armed with all the weapons developed by the German cartel, the French comptoir and the British monopoly in half a century of foreign trading. Unless America develops combinations of manufacturers of real fighting power, and is ready to invest money in the construction of railroads and other public utilities, it will be hard indeed to dislodge competitors so firmly entrenched.

Secretary William C. Redfield, of the Department of Commerce, summed up the situation when he said: "We have learned the lesson that our factories are so large that their output at full time is greater than America's markets can continuously and regularly absorb. We know now that if we run full time all the time, we must do it by reason of the orders we take from lands beyond the sea. To do less than that means homes in America in which the husbands are without work; it means factories that are shut down part of the time. And because the markets of the world are greater and steadier than the markets of any one country can be, and because we are strong, we are going to go out into the markets of the world and get our share."

Railroad Construction as Affected by the War

Review of the Situation and Discussion of Relative Importance of Different Classes of Work

ONE OF THE MOST IMPORTANT PROBLEMS which the railways of the country are facing now is the decision regarding the extent to which construction work shall be carried on during the war. There now exists a need for more improvement work than can possibly be completed under the existing conditions, and the problem resolves itself into the selection of that work which by its nature will bring the most immediate relief. This consists primarily in the amplification of existing facilities and the indications are that work of this character will be carried on to as great an extent as the supply of labor and materials will permit. While the construction of extensions and new lines can and doubtless will be curtailed it is probable that the total expenditures this year for railroad construction and improvement will exceed those of any recent year.

For the past three years new construction work has been relatively light, particularly with reference to new lines, terminals and other projects of an extensive character. This has resulted primarily from the uncertainty regarding the future of the railways and a lack of capital to carry on the work rather than from the fact that railway construction had outstripped the industrial development of the country. Also the labor shortage and the increased costs of both labor and materials since 1914 have contributed to this inactivity.

During 1917 the situation became acute and many of the roads found it impossible to complete their programs, even for improvements of a lesser nature. Work of all kinds was delayed through priority orders and the scarcity of labor and at the close of the year it was the common experience of roads in the territories where the conditions were especially adverse that a considerable proportion of the year's program of improvements was incomplete. In particular instances more than 50 per cent of the work planned for 1917 was not finished. With the additional traffic that the roads will be called upon to bear this year the situation is serious and demands special study in order that advantage may be taken of all opportunities to improve operating conditions and to provide the necessary facilities. Also for this same reason special care should be exercised in grading, selecting and concentrating on the most essential work.

Under normal conditions railroad construction work may be divided into two general classes: *extensive* development or the building of new lines and extensions, and *intensive* development or the improvement of existing facilities. This last class may also be divided into (1) the amplification of existing facilities by the enlargement of yards and terminals, the building of additional tracks or shop facilities, the installation of signals, etc., and, (2) the construction of new passenger stations, grade separation projects and other work of similar character which add little or nothing to the capacity or economy of operation of a road. While the same general division may be made, in times such as the present, there should be the further division of projects into those essential and non-essential to the prosecution of the war.

Under normal conditions new lines or extensions are constructed to reach traffic centers already served by other roads or to open up new territory not yet provided with railway facilities. Under the present scheme of non-competitive operation of the railways there is no good business reason for building new lines to points where adequate service is already provided. On the other hand it has been demonstrated that railroad construction into new territories is essential to the development of the country. Eventually the work of building new lines or extensions into territory without railway facilities will have to be done. The postponement of such construction only adds to the burden to be borne after the war and the advantage gained by deferring the work, thus making the capital, money and labor it would require available for other purposes is only temporary. Under the existing conditions this temporary advantage should be considered in so far as new projects are concerned. It may also be advisable in some cases to discontinue construction projects of this character that are already under way. On the other hand the work may be so far advanced that it may be more economical to complete the work than to drop it and leave idle the investment made. As an example

of work of this character may be cited certain extensions now under construction by the Santa Fe in the Southwest.

Construction work of any character at the present time brings the builder in direct competition with the government for materials and labor needed in the prosecution of war work. It also requires money needed for the purposes of the government. However, in favor of much of the railway construction work should be weighed the importance of adequate transportation facilities to the industries and the country at large. This applies particularly to the intensive development of facilities in so far as these improvements will facilitate the operation of the roads and increase their capacity. This includes the amplification of yard and terminal facilities, additional signals, engine house facilities and similar work. The importance of work of this character to our economic, industrial and military welfare was demonstrated last winter more fully than ever before when the slowing up in the operation of the roads through the combination of inadequate yards and terminals to handle the unprecedented traffic and extreme weather conditions was reflected in the very general retardation of industrial activities and in delay in shipment of food and supplies to our army in France and to the Allies. Such work should without question be carried on to the greatest possible extent.

In contrast with this, much work such as the building of new passenger stations, the separation of grades and other projects of a similar character which may be entirely justifiable under normal conditions, must now be classed as non-essential. When at all possible the starting of new projects of this character should be avoided, although where such work is already under way and may have progressed to such a state that to abandon operation would be an economic waste it should be completed.

This suggests that the construction program for an individual road for this year should give preference to work that will provide increases to existing facilities, followed by the work now under way which may not be considered essential but which may be more costly to discontinue than to complete. Where new lines or extensions are included in the program the justification of their construction at present should lie in the extent to which they are essential to the economic welfare of the country as a whole and not in any advantage that might accrue to the particular road. In general all work of this character must be considered secondary in importance to that outlined by the government as essential to the operation of the roads as a single system.

This unified control brings in a new class of work to be done, for a particular road or roads may be ordered to build certain facilities which under normal conditions would not be justifiable. As an example, it may and will become advisable in many instances to provide interchange facilities or inter-line connections which may simplify the operation of the roads as a system for which there would be little or no occasion under individual operation. Railway construction work for the near future will consist largely of improvement to amplify existing facilities. Particular attention will be paid to increased facilities for the care of motive power and additional and lengthened passing tracks, more signals, and in fact all work which will facilitate and lessen the cost of the operation of the existing properties. That work already under way which in the full sense of the word must be classed as unessential, will be completed is indicated by the announcement that the grade separation project of the Indianapolis Union railway at Indianapolis, Ind., will be completed. Conversely the order of the director-general that certain grade separation projects in the city of Chicago should not be started is indicative of the trend concerning work of this character which has not been begun.

These conclusions are supported to a certain extent by the recent order of the director-general with reference to all railroad work involving charges to capital account.

Government Supervision of Improvements

As director of the recently created Division of Capital Expenditures of the Railroad Administration, R. S. Lovett will receive and pass upon the reports made by the railroads as to their budgets of necessary expenditures for improvements. It has been ordered that the following rules be observed for work involving charges to capital account:

First: In determining what additions and betterments, including equipment, and what road extensions should be treated as necessary, and what work already entered upon should be suspended, please be guided by the following general principles:

(a) From the financial standpoint it is highly important to avoid the necessity for raising any new capital which is not absolutely necessary for the protection and development of the required transportation facilities to meet the present and prospective needs of the country's business under war conditions. From the standpoint of the available supply of labor and material it is likewise highly important that this supply shall not be absorbed except for the necessary purposes mentioned in the preceding sentence.

(b) Please also bear in mind that it may frequently happen that projects which might be regarded as highly meritorious and necessary when viewed from the separate standpoint of a par- and control of the railroads generally, and therefore when the facilities heretofore subject to the exclusive control of the separate companies are now available for common use, whenever such common use will promote the movement of traffic.

Second: The construction of new lines or branches or extensions of existing lines shall not be entered upon or contracted for without the director-general's approval.

Fourth: Work contracted for or actually commenced prior to January 1, 1918, and unfinished, may be continued until further order, except in so far as in the judgment of the carrier concerned it may be possible to discontinue or curtail it without substantial loss, in order to conform to the general principles outlined in paragraph First hereof.

Fifth: Other work which does not involve charges to capital account in excess of $25,000 may be contracted for and commended without approval of the director-general provided that:

(a) it conforms to the policy outlined in paragraph "First" hereof; that

(b) it also falls clearly within the policy of the particular carrier as that policy has been applied in practice during the two calendar years 1916 and 1917; and that

(c) a report giving a brief description of each project inticular company, may not be equally meritorious or necessary under existing conditions, when the government has possession volving not less than $5,000 nor more than $25,000 chargeable to capital account and showing also the amount chargeable to operating expenses, shall be made in duplicate to the director of the division of capital expenditures at Washington and the regional director for the district within ten days after the work shall be contracted for or commended.

Sixth: No work involving a charge to capital account and in excess of $25,000 shall be contracted for or commenced subsequent to January 1, 1918, unless

(a) it conforms to the policy outlined in paragraph "First" hereof, and unless

(b) it be authorized by the director-general.

Seventh: The director of the division of capital expenditures is authorized to prescribe such forms, require such reports and issue such regulations and instructions as may be necessary to carry out this Order.

In the eastern territory where the congestion was most severe last winter a committee of engineers consisting of Francis Lee Stuart, former chief engineer of the Baltimore & Ohio (chairman), A. C. Shand, chief engineer of the Pennsylvania Railroad, and H. A. Lane, chief engineer of the Baltimore & Ohio. has been appointed and attached to the regional directors' staff. The duties of this committee are to review the budgets submitted by the roads in this territory, separating the essential work from the unessential and grading the various projects in the order of their importance. The findings of this committee are submitted through the regional director to the director of the division of capital expenditures for final action.

Railroad Y. M. C. A. Building at Anchorage, Alaska

Remarkable Progress Being Made by R. R. Y. M. C. A.

Regular Program Not Only Extended and Intensified, But Doing a Big Service in War Work

By John F. Moore

General Secretary, Railroad Department, International Committee of Young Men's Christian Association.

THE RAILROAD YOUNG MEN'S CHRISTIAN ASSOCIATION, in operation for less than half a century, now has 270 branches established on the railroads which control 80 per cent of the total mileage of North America.

These associations operate upon a co-operative basis. Railroad managements and employees meet in their rooms upon a common platform. As a rule railroad corporations make reasonable monthly appropriations toward maintaining the associations, such appropriations being supplemented by membership dues and other revenues from the men.

Not many years ago approximately 70 per cent of all moneys expended in the conduct of these associations came as contributions from railroad companies and the remainder from the membership. This percentage has steadily changed in recent years until last year, out of every dollar expended approximately 65 per cent came from the men and not to exceed 35 per cent from corporations.

New Buildings

During 1917 new buildings and extensive additions were numerous. Among the former were those at Wilcoe, W. Va.; Bellmead, Texas; Benwood, W. Va.; Youngwood, Pa.; Groveland, N. Y.; Newell, Pa.; Brewster, Ohio; Gillen, Mich.; Turcott, Canada; Urbana, Ill.; Corbin, Ky.; Sharonville, Ohio; Segundo, Colo.; and Sunrise, Wyoming.

During the year many buildings completed in other days became inadequate, because of the ever-increasing demands made upon them, necessitating large and important additions. Among such associations were: Douglas, Arizona; Pocatello, Ida.; Chicago Junction, O.; Shenandoah, Va.; Handley, W. Va.; Bridgeport, Ontario; Haselton, O.; Two Harbors, Minn.; Parsons, Kan.; Rochester, N. Y.; and Binghamton, N. Y.

The above are partial lists of buildings and additions definitely opened during 1917. In addition to these, new structures are already assured during 1918 and 1919 at Lexington, Ky.; Pine Valley and Cleveland, Ohio; Bellwood, Pa.; Brownsville Junction, Maine; Pen Argyl, Pa.; Knoxville, Tenn.; Channing, Mich.; Clifton Forge, Va.; Hulburt, Ark.; Lamberts Point, Va.; Glassport, Pa., and Cane Fork, W. Va., while at Fort Worth, Texas, $40,000 has been raised toward an association building without any corporation gifts thus far; and at Kansas City four lots valued at $50,000 have been set aside by the Terminal Company as site for a railroad Association building.

This significant list of new buildings and enlargements either recently completed, now under construction, or definitely assured for the early future, indicates the degree in which the Railroad Association has by its work won the confidence of railroad administrations and railroad men alike. It is significant that, after being under close scrutiny for nearly half a century, appropriations from corporations and gifts from friends mounting into hundreds of thousands of dollars should be made for its extension.

In the early days the Railroad Association confined itself largely, though never exclusively, to men in train service, and this field continues to constitute its largest single field of operation. Nevertheless, with the years, the scope of its endeavor has constantly been extended, until now its work is adapted to meet the requirements of all railroad men. In fact, it has within its membership thousands of men related to affiliated interests; as for example, express company and mail service employees.

In addition to opening new buildings, the work of the Railroad Department of the Young Men's Christian Asso-

ciation has within the past year been intensively developed along the following lines:

Street Car Employees

Street Railway Young Men's Christian Associations are now in successful operation in a number of cities, more especially in the South, and it is planned that after the war an experienced traveling secretary will be assigned to devote his entire time to the development of this interesting field.

A new association of this character was recently organized at Norfolk, Va., in a building leased for that purpose by the Virginia Railway & Power Company.

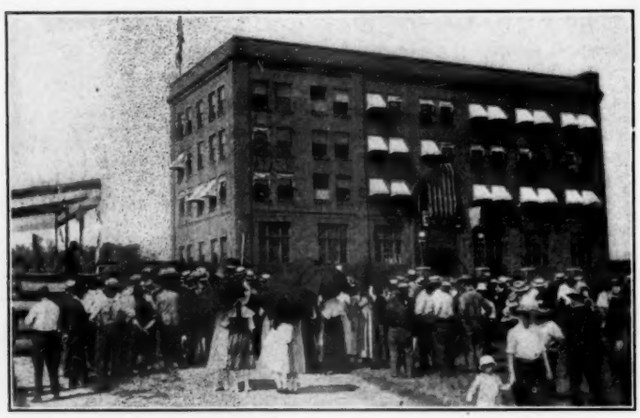
Colored Railroad Employees

An investigation was recently made by one of the colored secretaries of the International Committee into the condition of colored employees on a great railroad system. A detailed report was submitted, looking to further co-operation by this organization in the solution of this difficult problem.

A small building was opened during the year at Chicago Junction for the exclusive use of colored railroad employees, and several associations are now experimenting along this line.

Women Railroad Employees

The question of how to be of service to the women employees on railroads has been given consideration, and experiments have been made. A number of associations have made special membership rates for such employees and have established special privileges for them. For example, at Albany, N. Y., educational classes and practical talks are being conducted for young women studying railway telegraphy, while at Brewster, Ohio, an annex association building has been erected for the exclusive use of women railway employees, the wife of the secretary of the Railroad Association acting as matron.



Opening of New Railroad Y. M. C. A. Building at Brewster, Ohio

Boys of Railway Communities

It is increasingly recognized that many railroad associations, without impairment of service for railroad men, might render an inestimable contribution to the whole life of railway communities by relating themselves to the life of boys in railroad homes. It is clearly recognized that any work of this character needs to be conducted with the utmost caution, so as not to conflict with the rights and privileges of railroad men.

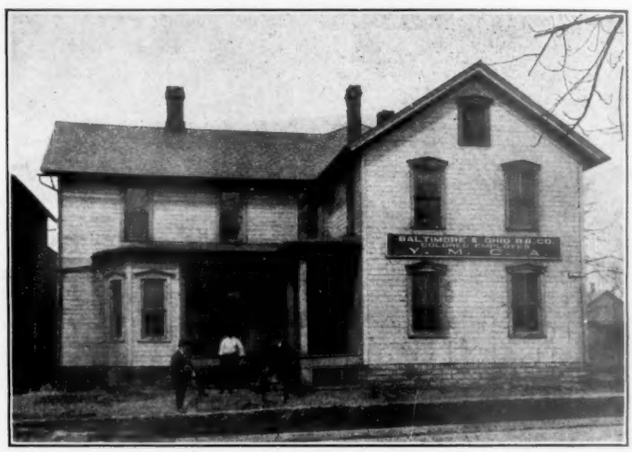
An experienced railroad secretary of the International Committee recently made a careful study of this question and his report made clear the fact that the Railroad Association has a rare opportunity, by helping the sons of railroad men, to assist in tiding them over the critical period of boyhood and ushering them safely into strong, useful manhood.

Sixty-one railroad associations now do work of this character, and no fewer than 22 of that number have on their employed force secretaries giving their entire time to this definite work.

Railroad Men in Other Lands

The work of the Railroad Association in America has attracted attention in other countries, with the result that similar related organizations are now in successful operation in India, Japan, Korea and Manchuria, while an experienced American secretary is in China studying the language, so as to be equipped to promote this movement among the railroads of the great eastern republic.

In a recent address to a group of men at the Bankers' Club in New York City, Major General Hibiki, of Japan, a member of the Railroad Committee of the National Council of Young Men's Christian Associations of that country, made the following statement:



Railroad Y. M. C. A. Building at Chicago Junction for Colored Employees

"I bring greetings from the Japanese Railroad Young Men's Christian Associations to the secretaries and members of the American organization.

"Our Japanese Railroad Association was organized after studying your work in America 14 years ago. We have now more than 30,000 out of the 100,000 railroad workers in Japan as members of our Japanese Railroad Association, and our National Secretary, Mr. Masutomi, is with me in this country, studying your work and aiming to secure your co-operation in its further extension."

At Jamalpur, in India, the association furnishes an illustration of how a railway community may be served on an adequate scale. The building is furnished by the East Indian Railway and operated by the Young Men's Christian Association. How the life of the community—physical, mental, and moral—is stimulated, is indicated by the following quotation from a recent report of the secretary:

"The four football fields, cricket ground, golf course, rifle range, tennis courts, bowling green (lighted by electricity), swimming pool, reading room and library of 1,500 volumes are mostly in frequent use and perform a distinct social work in bringing together the members on terms of good fellowship. First-class bioscope shows are held every week in our fine Y. M. C. A. auditorium, and I am about to start a series of weekly or fortnightly popular lectures, generally illustrated, on various topics of interest, scientific and scenic. Y. M. C. A. socials and teas are occasionally held, and we have band con-

certs twice a month. Nearly all the Europeans of Jamalpur belong to the association, and we give some of its privileges to even the youngest Boy Scouts."

Conduct of Campaigns

In these stirring days when governments are emphasizing the value of campaigns as a safe and sane method for stimulating interest and securing results, the Railroad Department has continuously conducted, in all parts of Canada and the United States, thrift, safety first, temperance, first aid and health campaigns among railroad men and their families.

On one important system a campaign to encourage apprentice boys in railroad shops to clean living proved most beneficial. Carefully selected lecturers visited important shop centers, specially prepared literature was freely distributed, and scientific charts were exhibited, all with most satisfactory results.

Growth of Membership

Near the close of 1916 a ten-day national membership campaign resulted in securing over 38,000 new members for

A Japanese Railroad Y. M. C. A. Secretary

the Railroad Young Men's Christian Association, although how far these men would renew memberships after the enthusiasm of the national campaign had passed was a question difficult to answer until submitted to test. The test has been made and most successfully met; a few instances will illustrate the manner in which railroad men have responded to the call for renewal.

At Jersey City the Railroad Association, which in 1916 secured 789 new members in ten days, secured 1,051 renewals and new members in ten days in 1917. At Clifton Forge, Va., where nearly 1,000 new members were secured a year ago, 1,100 new members were secured in a single day in November, 1917. At Louisville, Ky., three of the 678 new members secured in 1916 secured 672 new members themselves in the campaign of 1917.

The Pueblo, Colorado, association caught the conquering spirit of the Rockies and secured more men than in the year preceding.

The Work in a Nutshell

The following brief summary of facts suggests the history and status of the Railroad Department of the Young Men's Christian Association:

First. The first railroad association was organized in Cleveland in 1872.

Second. At present there are 270 railroad associations in operation in Canada and the United States, and at least 15 additional new associations assured of organization during 1918.

Third. This organization has been extended until there are now railroad associations located in many parts of the world.

Fourth. The present membership is approximately 125,000. Annual dues vary from $3 to $10, depending upon location and advantages offered. Added charges are made for dormitory and other special privileges. Wherever equipment is adequate and buildings not overcrowded by members, privileges are open to all railroad men.

Fifth. Membership is open to all self-respecting railroad men, irrespective of creed, position, or nationality. Each local association is conducted by a committee of management, composed of men from the membership. As a rule, these committees have on them both local railroad officials and men from the rank and file.

The work of the railroad association is supervised in part by the International Railroad secretaries, who devote their entire time to this work and in part by supervising state railroad secretaries, who are definitely assigned to this specific task.

Seventh. More than 600 trained railroad secretaries devote their entire time to promoting the physical, mental, social, moral, and religious welfare of railway men. These secretaries have been carefully selected; some among them have had four years of preparatory technical training in association colleges, and nearly all take yearly special training at some one of the six summer schools conducted for railroad secretaries.

Eighth. The work of the railroad association is four-fold in character, social, physical, mental, and moral. To these ends it maintains reading rooms, libraries, educational classes, practical talks, baths, gymnasium, outdoor and indoor ahtletics, entertainments, socials, games, correspondence facilities, non-sectarian religious services (attendance optional), dormitories, restaurants, and lunch rooms, and also promotes campaigns along the line of first aid, safety first, thrift, temperance, health, etc.

Ninth. The 270 railroad associations already organized operate in a variety of types of buildings and with varying degrees of equipment, ranging from the splendid home of the association for New York Central and New Haven employees in New York City, to the cars set apart as a temporary and inadequate association plant at some needy railway terminal.

Tenth. Buildings operated by the railroad association are sometimes owned by that organization, sometimes owned jointly by railroad association and railroad corporation; and in still other instances, owned by the railroad company and leased or given to the association for operation.

Eleventh. The approximate value of property now owned by the Railroad Young Men's Christian Association exceeds $4,000,000, while the value of property owned by railroad companies and leased or given to associations for operation is even larger.

Twelfth. In 1917 North American railroads appropriated toward the maintenance of railroad associations approximately $350,000. In the same year receipts from membership fees exceeded $400,000 while large additional sums

were secured from use of special privileges such as dormitory, games, etc.

Effect of Government Control of Railroads

The question as to how far, if at all, government control may affect the future of the Railroad Young Men's Christian Association has arisen in some quarters. However, assurance has already been received from the government that the work of this organization will continue as heretofore and it is confidently believed that the status of the association will remain unimpaired, for the following, among many reasons:

First. The Interstate Commerce Commission has made definite allowance for expenditures by railroads for the organization, equipment, and conduct of Railroad Young Men's Christian Associations.

Second. In the history of railroad receiverships receivers have almost without exception continued association appropriations as necessary and legitimate items of expenditure.

Third. On the only government-owned railroad in the United States, that in Alaska, a Railroad Association has been conducting successful work, with an appropriation from the government toward its maintenance.

Fourth. A successful experience of more than 40 years has adequately demonstrated that the Railroad Young Men's Christian Association is not a thing apart from, but an integral and essential factor in, the successful operation of a railroad.

Fifth. The Railroad Association is the only organization of its character known, with international relationships; a trained personnel; a proven power of adaptation; a scientific and comprehensive program of work; and a practically unbroken record of striking accomplishments.

The religious basis and motive of the Young Men's Christian Association is the secret of the great strength of the organization; for, because of it, men of high gifts enter its secretarial service and it gives to the movement a cohesion and permanence that enables it to continue unshaken through the vicissitudes of the years.

War Work of R. R. Y. M. C. A.

The great world war brought to the Railroad Association new and unexpected responsibilities. It was called upon to enter new and vital fields and responded promptly.

The War Work Council of the Young Men's Christian Association organized a Bureau of Transportation, with special relation to soldiers and sailors in transit on land and sea. This bureau instinctively turned to the Railroad Association for leadership and co-operation.

When the first quota of the new National Army was summoned from home to cantonment, the railroads were called upon to undertake a difficult task and, in a manner challenging admiration, carried hundreds of thousands of these new soldiers with a minimum of friction and slight impairment of regular service.

When it was learned these embryo soldiers were to be moved, Railroad Associations promptly made arrangements to have their secretaries accompany them from their homes on their journey to khaki and camp, and on more than 800 trains representatives of Railroad Associations were at work. These secretaries passed through the trains, telling the boys about the camps to which they were assigned and also of the huts of the Young Men's Christian Association and the Knights of Columbus, reminding them also of the fine work of the Young Men's Hebrew Association. The men in each car were told that they would be made welcome by all these agencies that were working as one and that they would find in the association and other huts a friendly greeting and a sure cure for homesickness and blues.

The value of this service is indicated in hundreds of letters that have been sent to the International office in New York City. One such letter, written by H. O. Williams, an International Railroad Secretary, who recently accompanied one of these trains, is typical of all:

It was like any one of the great number of selective draft troop trains that the Railroad Y. M. C. A. secretaries have accompanied to cantonments the past fall and winter. This one left Long Island City one bleak, raw, snowy winter morning with twelve cars well crowded with mothers' boys, many of whom were leaving home for the first time to meet the call of our government as soldiers of the American flag.

With two associates I went through the train, telling the boys about the value of the Army "Y" and how large an opportunity at Yaphank awaited them and of the benefits and blessings they would receive. After an informal talk of a few minutes in each of the dozen cars, I went back to the forward end of the train in order to have interviews with a number of these young men. Before the journey was ended I sat down and talked with twelve or fifteen of them. The first was a representative of the gas house gang and was already prepared to fight the Germans single-handed. He embraced me affectionately and was insistent that I should share the contents of a bottle he had with him. After a heated argument, I convinced him that it would be better if I did not share in his conviviality, and so he played the part alone. He promised, however, that this would be his last drink, no matter whether the government interfered with him or not.

In the second car I saw a young Jewish boy, possibly twenty-one or twenty-two years of age, sitting alone, his lip trembling, and the tears coursing down his cheeks. I sat down with him and he told me that he was a young musician, a pianist, and had been giving concerts in New York City. He was glad to be called to the colors and the only reason he hated to go was because he would have no opportunity to play the piano, or, as he said, to live with his music. When I assured him that he would find a piano in every Army Y. M. C. A. bungalow in the cantonments, his face brightened and he said, "It's all right if I can have my piano and an opportunity once in a while to touch it up a bit."

In another car, I noticed a fine, red-checked, bright-eyed, clear-faced young fellow sitting alone, and when I sat down with him he told me that he was the most prominent real estate man north of 110th street in the city of New York. He had made a large income for several years, had left his mother and sister in good circumstances, and was ready to do his part. He only hoped he would pass the final physical examination, but was a little worried for fear some slight heart trouble might cause his rejection after reaching camp. He had known something of the work of the Association in Harlem and appreciated its advantages and benefits.

A young fellow with whom I sat said, "I am going to send the folder you handed me to my parents, because it portrays the comprehensive work of the Association. I am a traveling man and have been on the road for the last seven or eight years, representing one of the largest linen houses in New York City. I have been a member of the Association for all that time and in many cities have taken advantage of the privileges offered. My parents live in San Francisco and I have often written them about the great blessings and benefits that have come to me through the Associations which I have visited in my territory. As soon as I reach camp and have an opportunity to tie up to one of the Associations there, I shall do so and do anything I am asked to help promote the work."

Another had been a policeman in the 22d Street District in this city; had already received his discharge from the army after six years of service; had served three years on the police force; and had just been enrolled in the selective draft. He knew the work of the New York City branches and was enthusiastic about its benefits and ready to co-operate in the camp.

With the exception of the first car there was no drinking on the train. The young fellows were resolute, determined, hope-

ful, and ready to do their part in winning this war for freedom and the perpetuation of Democracy.

Under the direction of the Bureau of Transportation, secretaries also accompany trains of uniformed men as they journey from camp to camp or from camp to port of embarkation, and conducts work at ports of embarkation, such as Hoboken and Newport News and at great transfer centers such as St. Louis and Chicago.

It does not require much exercise of imagination to recognize the value of service such as this to the sorely pressed railroads, to the men themselves in a difficult and trying hour of their lives, and to the country now at war. Many railroad officials have frankly expressed their cordial appreciation of the aid these secretaries have given in helping to keep men contented and busy during long hours in transit and so helping to reduce to a minimum that spirit of restlessness which, unemployed, might easily develop trouble, embarrassment, and delay.

Railroad Secretaries at the Front

The Railroad Association, alive, as ever, to its responsibility for railroad men here at home, has not only thus manifested its power of adaptation in the manner in which it has entered the field of service among men in transit here at home, but is also proving equal to a call made upon it by railroad engineers overseas.

Thousands of American railroad men are now at the front and the difficulty of working among these men, scattered, as in many instances they are, seemed for a time almost insuperable. Progress, however, is being made rapidly, as is indicated in the following letter recently received from France:

I am pleased to report that since January 1st there have been special and interesting developments in connection with our service for men engaged in railway construction and operation. Although several of these regiments are broken up into small units of one or two companies each, the Association is now working with approximately 75 per cent of the men in this branch of service in France and in another 30 or 60 days our work will be practically upon a 100 per cent basis in this matter.

For one regiment which is intact we have provided a splendid double hut, with full equipment. Our service to most of the other railway regiments is now being carried on in canvas buildings with demountable frames, so that we may move quickly as companies or regiments move.

We are also serving the engineer units attached to the larger commands. One of the railroad secretaries reaching here recently has been assigned to service with a railway regiment recruited from the west and now engaged in railroad operation in a most interesting section immediately back of the French lines.

Among the experienced railroad secretaries already selected for this service and now in France working among railroad men are the following: F. G. Smith, A. B. Adams, B. T. Stone, S. L. Thomas, W. J. Tubbs, E. Dow Bancroft, W. A. Cochran, C. C. Kent, R. R. Jenkins, E. F. Gailey, Roland Swift, Fred T. Harshaw, W. L. McKinley, George E. Burgess, Sydney Morse, C. B. Flagg.

A letter from a railroad man at the front to W. N. Northcott, associate secretary of the Transportation Bureau of the War Work Council, illustrates the appreciation of what the Association is doing for men on or near the battle line:

The Thirteenth Engineers are doing some great work here behind the French lines and all of the boys have their heart and soul connected with the work. We are the only regiment of engineers attached to the French and we have sure picked up the French method of railroading very fast. Their method is very different, it is odd. The hook and eye couplers as we call it, which it is. We have one of the Chicago Y. M. C. A. secretaries with us now, and he is sure a live wire. He has not been with us very long, but has made a great impression on the boys already and is sure to make a great success with us and we all look toward you to use your influence to keep him with us, as he is just the man we have wanted since the Y. M. C. A. has been with us in France. His name is R. R. Jenkins. He is from some railroad junction near Chicago, the name of which was changed to Willard. I just was visiting him in his room and he is a very pleasant man to talk to and seems well satisfied here with the boys. He has already proved his worth to his regiment.

In Conclusion

The Railroad Young Men's Christian Association is a great and growing organization, although it makes no idle claim to perfection. Those most familiar with its activities are most conscious of its occasional failures. Nevertheless, when its history and accomplishment are fairly judged, it stands out as the most successful organization of its character that the world has known.

Its failures have been due to the human equation, but although occasional men have not been equal to their great responsibility, the high purpose, the unselfish devotion, and the fine organization of the Railroad Association have ever carried it onward.

Less than fifty years ago a small group of railroad men met at Cleveland to organize the first Railroad Young Men's Christian Association. Today, within the life span of men who were active then, these associations have become located on practically all of the great railroads of North America, while outposts are established in distant lands and on the islands of the sea.

Its membership grows constantly; its leadership increases in numbers, experience, and efficiency; its property holdings are considerable; its motive is unselfish; its sympathies are broad and practical; and in what has been accomplished already in these relatively few years there is abundant promise that the Association stands upon the threshold of larger opportunity and more striking achievement.

"To Make the World Safe for Democracy—This Thing Must Be Crushed"—President Wilson

The Future of the Federal Valuation Work

The Shortage of Engineers, Government Control and Decision Not to Report Final Value Introduce Uncertainties

ONE OF THE FIRST QUESTIONS which was raised when the government took over the railroads concerned the effect of this action on the federal valuation work. This question still continues to be raised and still remains unanswered. The future of the valuation work therefore remains a matter of conjecture, although certain tendencies are becoming evident. It is to be expected that a definite statement will soon be made by the Railroad Administration outlining its attitude towards this work.

The federal valuation work has now been in progress for five years, the bill providing for it having been signed on March 1, 1913. The remainder of that year was spent in organizing forces and preparing plans and it was early in 1914 before the government undertook field work actively. Since that time the roadway and track parties have inventoried over 150,000 miles of line, or 60 per cent of the mileage of the country. Approximately 53,000 miles of line was covered in the year ending September 30, 1917. Based on this progress the Interstate Commerce Commission estimated in its last annual report that the engineering forces should practically complete the field work during 1919 and should finish this and the office work during 1920. It was also stated that the work of the land and accounting sections should be completed at the same time.

Less progress has been made in completing the reports on individual properties. Tentative valuations have been served on several of the smaller carriers and hearings have been held on these reports but no final figures have been turned over to the commission by the Division of Valuation as its conclusions regarding the value of those properties or of any portions of them. In fact, it developed a year ago that the Division of Valuation now interprets the law as not requiring it to determine a final and complete valuation of any property but only to report to the Interstate Commerce Commission on the various elements of value. The announcement of this attitude which, in the opinion of the director as well as most railway men, does not comply with the intent of those who prepared the bill and supported its passage through Congress, has caused many railway men to lose interest in the work and to raise serious doubts regarding the value of the results which will be secured.

While railway men in general did not oppose the passage of the valuation law actively few of them received it with any degree of enthusiasm. With certain exceptions, the general feeling has prevailed that the results to be secured would not be commensurate with the heavy expenditure involved and that the main benefit to the roads would be the indirect one of quieting the harangue of the agitators regarding overvaluation. In spite of skepticism regarding the value of the work the roads have co-operated consistently in its prosecution, both in their individual capacities and through the Presidents' Conference Committee, which was organized to harmonize the conflicting ideas of the roads and to provide a common agency to represent the roads as a whole in negotiations with the government.

With the entrance of the United States into the war a year ago, a new question was raised regarding the valuation work—whether it should be classed as essential or non-essential to the winning of the war. The valuation work is requiring a large force of men, almost all of whom are technically-trained engineers and most of whom are of military age. The Division of Valuation employs over 1,500 men. The roads in the eastern group alone employ an equal number. On this basis over 5,000 engineers are now employed in valuation work by the government and by the roads.

This large force is engaged in valuation work at a time when there is an acute shortage of engineers throughout the country. The intricate science into which warfare has developed has created a heavy demand for engineers and they have been called into military service in larger numbers than in any previous conflict. Many railway organizations have been very seriously depleted in this way and in numerous instances valuation forces have been almost entirely wiped out by enlistment and conscription. In order to meet the demands of the government for men it has been necessary to transfer engineers from maintenance and construction, frequently to the serious detriment and delay of work under way. It was a common experience last year for work to be held up pending the completion of plans, delayed by a shortage of draftsmen, while on at least one western system contractors were delayed in many instances because of the inability of the engineers on the road to set the necessary stakes. Under such conditions it is not surprising that there has been a strong feeling that this work, which demands so many engineers, should be called off for the duration of the war in order that these men may be employed in the routine maintenance and improvement work which is so necessary to the operation of the railroads at the present time.

The feeling that the valuation work should be discontinued during the war has not risen solely because of the shortage of men, for there has been a further feeling that in view of the government's plea for economy in expenditures it was unwise to continue work for which the annual government expenditure is $3,500,000, and for which the railways must spend probably $5,000,000 more. The position now taken by certain officers of the Division of Valuation that the railways should not be concerned with the expense of this work as the government is now paying the railways' share of the cost through its guarantee of earnings is not a reply to this criticism for if the work is to be continued the money must be spent and if the government pays for it it must come out of the same treasury that is financing the war.

The feeling that the valuation work should be classed as non-essential prompted the introduction of a bill into Congress recently calling for the discontinuance of this work. It has also led the directors of the Philadelphia Bourse to adopt and forward to Washington vigorous resolutions asking that Congress repeal the law and requesting early action on the bill now before Congress.

With the taking over of the railways by the government on December 28, still another element was introduced into this problem. Regardless of the attitude of the Railroad Administration toward government ownership, the assumption of direct control of the operation of the roads by the director general has brought government ownership more directly before the people. For this reason some railway men who have been lukewarm regarding valuation work previously, now feel that a complete inventory of their properties will be important in the event that the government takes over the roads permanently. This has led to agitation in some quarters for the continuance of the work, at least to the point that the inventory of the physical property should be completed.

Up to the present time the administration and the Division of Valuation have announced no change in the program of work and it is being continued just as before government

control became a reality. The director general has appointed the director of the Division of Valuation as a member of his immediate staff, which may have no significance whatever, but which may also be taken to indicate a close affiliation between the Railway Administration and the valuation work which will insure its continuance until completion. The question will undoubtedly come up for final decision before Congress when the appropriation for the coming year is passed upon this spring. In the mean time the division is proceeding with its authority to complete the work.

The Railway Supply Field—Prospects for 1918

Realization That Railroads Are Our Third Line of Defence in Transportation Means Much to Manufacturers

THE RAILWAY SUPPLY FIELD enjoyed in the year ended December 31, 1917, one of the most prosperous in its history, as has been evidenced by the recently issued annual reports which have shown the greatest earnings, for many companies, for any year in their entire history. There is prospect of a large business the rest of 1918, although its profitableness will depend on the price policy of the Railroad Administration.

Thus far this year the orders for cars and locomotives have been few, but the car and locomotive plants have been able to continue at work, under severe difficulties from the standpoint of labor and materials, it is true, on railway equipment orders placed many months ago or on guns, shells or other material for the government. Now there are soon about to be added to this business, large orders for cars and locomotives for the government, and conditions will be further improved by the priority that will be given to material for these orders for the very reason that they are on government work.

If there were nothing else in the situation that should lend optimism to the supply field there is the fact that at last the government has seen the urgent necessity of providing at once for the needs of our American railroad system.

This brings up the interesting question of what is likely further to develop along this line in the future.

"It has become perfectly evident to all observers," says an editorial in last week's Coal Age, "that the capacity of the nation for production of war material is enormously greater than its capacity for shipping it to Europe, and that we must at once not only balance this production, but slow it down in order to prevent such a choking of our eastern ports as may produce an impossible condition. The answer comes that if we are making too much war material we had better turn some of our activities into the manufacture of articles of peace. Immediately we run into the financial situation, which now seems to hamper seriously new undertakings.

"It would seem that the claim of the railroads that they need $1,000,000,000 worth of improvements should at this juncture be considered. Here is one organization now devoted exclusively to the service of the community, which, being under the control of the Federal Government, can be financed directly by that government, and there would seem no reason why the production programs of war material should not be limited, and a certain amount of the energy now being expended in that direction turned at once toward the improvement of our transportation facilities."

No less important than munitions and supplies in this war is transportation at the front, behind the lines, on the sea or behind the seaboard at home. It is a very apt cartoon that recently appeared in some of the metropolitan newspapers showing a camel heavily laden with munitions of war essaying to go through a wall the entrance through which, representing the shipping, was only large enough to permit the passage of its head and neck. The same analogy might be well applied, although in a smaller measure, to the railroad situation.

Railroad men recognized it years ago, but it has been only recently that the authorities at Washington have seen it. For months last year our car and locomotive plants were turning out cars and locomotives for Russia and France and for our own military forces in France, while engines that were urgently needed for our own railroads at home were held up until in the heart of winter it developed that for lack of boats we could not ship all the material that was ready, overseas, while the American railroads themselves were crippled for want of cars and motive power. This, we are all agreed, must not happen again. We must take no further chances with our railroads. Germany today is tremendously handicapped for lack of cars or locomotives. In fact, one French authority, who is quoted elsewhere in this issue, says that one of the best things the allied airmen could do would be to destroy German locomotives, for they cannot be replaced. There is no reason why we should ever reach a serious condition such as that.

No one doubts that the first thing we must do, however is to do our utmost to provide material for the new ships. They are our first line of defence in transportation. The railways now being used behind the lines in France, by the soldiers of England, France and the United States make up the second line, while the railways here at home supply the third. All must be in first-class condition to guarantee a

EARNINGS OF REPRESENTATIVE COMPANIES—1917 AND 1916

	1917	1916
American Steel Foundries:		
Gross earnings	$49,369,584	$31,361,006
Net income	5,531,839	3,418,057
Total surplus	6,429,228	3,651,670
Baldwin Locomotive Works:		
Gross earnings	98,263,865	59,219,057
Net income	8,305,722	2,619,466
Total surplus	15,855,346	8,949,624
Bethlehem Steel Corporation:		
Gross earnings	298,929,531	216,284,556
Net income	27,320,737	43,593,968
Total surplus	28,513,615	44,370,198
American Locomotive Company (semi-annual report):		
Gross earnings	35,959,126	37,863,594
Net income	6,010,009	5,453,334
Total surplus	.....	.....
Pressed Steel Car Company:		
Gross earnings	44,034,843	31,202,646
Net income	2,130,308	2,751,152
Total surplus	.....	10,217,069
New York Air Brake Company:		
Gross earnings	10,157,038	24,051,103
Net income	1,893,826	8,214,962
Total surplus	9,976,416	8,082,591
Railway Steel Spring Company:		
Gross earnings	23,905,714	14,086,499
Net income	4,307,860	2,710,806
Total surplus	8,657,801	5,969,942
Republic Iron & Steel Company:		
Gross earnings	78,325,461	52,844,018
Net income	16,616,532	15,647,900
Total surplus	12,475,737	9,881,298
United States Steel Corporation:		
Gross earnings	1,683,962,552	1,231,473,779
Net income	224,219,565	271,531,730
Total surplus	431,660,804	381,360,914

steady stream of munitions, supplies and men to France. We can neglect none of them.

The supply field naturally wants to see the railways of this country kept in first class condition,—it is the railway supply business that our manufacturing companies are most familiar with and best equipped to handle. Presumably they will be guaranteed a continuation and possibly an extension of this part of their activities during the coming months.

There has been a very evident change in the railway supply field, a tendency towards diversification, and a very healthy broadening of interests. The average railway supply company not so many years ago specialized on railway supplies alone and perhaps on a single line of products. Today the fact is the reverse. On the one hand, some companies have expanded into other lines of endeavor, and several of the most successful companies have also added many other and rather dissimilar lines of railway specialties. On the other hand, there have been many outside companies, new to the field, who have realized the immense possibilities attendant upon the sale of supplies to railways.

We can omit guns, shells and other war material as special war-time factors, although a very large number of companies in the supply field are now engaged in their production. But we can notice that the Baldwin Locomotive Works, some time since, bought the Southwark Foundry & Machine Company to add to its line gasoline engines and similar products; that the American Car & Foundry Company has so diversified its work that now it is in a very advantageous position when it comes to handling an enormous order for shrapnel helmets; that the Locomotive Superheater Company is building up a large business in marine superheaters; that the Chicago Railway Equipment Company has so diversified its work that now 70 per cent of its business is in other than railway specialties. And last, but by no means least, there is the steel industry which at one time supplied over 40 per cent of its products to the railways and now supplies nearer 10 per cent. The peculiar buying methods of the railways, be it repeated, are not the only reason for such diversification, but they are a big reason, particularly since regulation tightened down too much to permit of the extent of progress and expansion that was necessary to the railway industry.

On the other hand, there are other companies which have taken on railways as additional customers. Among such companies can be instanced the Barrett Company, the Carborundum Company, the Norton Company, the H. W. Johns-Manville Company, a number of paint concerns, several belting manufacturers and an exceptionally large number of machine tool builders, all companies which have realized the immense possibilities of selling to an industry that purchases a billion dollars' worth of goods a year, but all of them companies whose industry was already diversified before they entered the railway supply field.

The pending Government orders for cars and locomotives will naturally have a tremendous influence in the railway supply field, as has been discussed previously in this paper. But they will by no means take up all the country's capacity for an extended period of time, nor will they change seriously the tendencies that are mentioned above.

Now what is the ultimate answer? What is going to be done when the orders for the government are completed and after the Kaiser's defeat makes no longer necessary the continued manufacture of guns and shells? There are two answers: (1) A continued diversification to take care of the natural expansion that cannot be utilized by the demands for railway supplies at home. (2) Export trade. Both are necessary, one as much as the other. Diversification because it will help to produce economies. A foundry, a forge shop or a machine shop can be used for other things besides the manufacture of railway material, and particularly may it be so used to take up the slack in railway demands. Export trade, because diversification alone will not suffice and because it, too, will help to take up the slack in domestic railway demands.

But there is far more to the export proposition than that, and any manufacturer must fully realize this condition before he can ever hope for a continued and successful export business. The point, in short, is that there will be a tremendous opportunity for American railway supply houses in export trade. For many years after the war there will be but two countries in the world which can hope to secure an extensive export trade in railway supplies—England and the United States. The wise American railway supply manufacturer, or at least he who did not have a large business in foreign lands before the war, is already beginning to realize that there is a tremendous opportunity in export trade, that will help take up his increased capacity and will yield him profitable returns; and the wisest manufacturers among them all are those who are now making their plans and getting in the missionary work in favor of American equipment and American standards.

THE CAR AND LOCOMOTIVE ORDERS OF THREE MONTHS

Locomotives (Domestic)

Canadian Government Rys.	6	0-6-0	Canadian
	4	Ten-wheel	Canadian
Chesapeake & Ohio	15	2-6-6-2	American
	10	Ten-wheel	American
Delaware River Steel Company	1	Four-wheel	American
Grand Trunk	25	Switching	Canadian
Hocking Valley	20	2-6-6-2	American
Hudson Coal Company	1	Four-wheel	American
Illinois Central	4	Santa Fe	American
Long Island	4	0-8-0	American
Maine Central	8	Ten-wheel	American
	4	0-6-0	American
Miami Conservancy District, O	3	Four-wheel	American
	10	Four-wheel	American
Minneapolis & St. Louis	15	Mikado	American
	5	Pacific	American
Missouri, Kansas & Texas	25	Mikado	American
Philadelphia & Reading	15	.....	Co. shops

Locomotives

During the three months specifications were determined on orders received by the American Locomotive Company some months ago for the following locomotives:

Central Vermont	5	Mikado	American
Delaware & Hudson	20	Consolidation	American
Delaware, Lackawanna & Western	15	Mikado	American
Long Island	4	0-8-0	American
Portland Terminal	2	0-6-0	American
Western Pacific	5	Mikado	American

Locomotives (for Export)

Chilean State Rys.	20	Mikado	American
Rhodesian Rys.	9	Mountain	American
South African Rys.	20	Mountain	American
South Manchurian Ry.	25	Mikado	American

Freight Cars

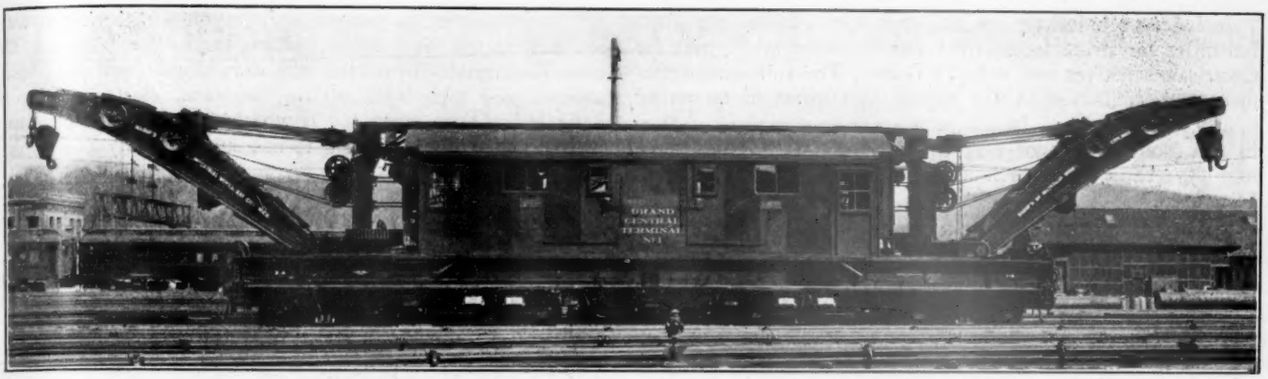
Brier Hill Iron & Steel Co.	40	Hopper	Pressed Steel
	10	Gondola	Pressed Steel
	25	General service	Clark Car Co.
Butterworth-Judson Company	75	Tank	Cambria
Canadian Government Rys.	5,000	Box	Canadian C. & F.
	450	Ballast	Canadian C. & F.
	300	Stock	Canadian C. & F.
	750	Flat	Eastern Car
	650	Coal	Eastern Car
	1,000	Box	National Steel
Chicago, Milwaukee & St. Paul	5,000	.....	Co. shops
DuPont de Nemours & Co., E. I.	35	Flat	Am. C. & F.
	14	Box	Am. C. & F.
	44	Shell	Am. C. & F.
Kansas City Structural Steel Co.	100	Tank	
LaBelle Iron Works	5	Tank	Penn. Tank Car
Penn American Refining Company	8	Tank	Penn. Tank Car
Phoenix Cotton Oil Company	8	Tank	Penn. Tank Car
Republic Iron & Steel Company	200	Coke	Pressed Steel
United Gas Improvement Company	3	Tank	Penn. Tank Car
United States Government	950	Box	Am. C. & F.
(for France)	500	Gondola	Cambria
	250	Box	Mt. Vernon
	500	Box	Pullman
	200	Box	Standard Steel
	750	Gondola	Standard Steel
	250	Refrigerator	Has. & Barker
	100	Box	St. Louis Car
	500	Gondola	Has. & Barker
	375	Gondola	Standard Steel
	200	Box	Standard Steel

Freight Cars (for Export)

Colombian Northern	6	Gondola	Am. C. & F.
Guantanamo & Western	25	Box	Am. C. & F.

Passenger Cars

Canadian Government Rys.	7	Dining	Pullman
	14	Sleeping	Pullman
Duluth & Iron Range	5	Coaches	Pullman
Colombian Northern	2	3rd class	Am. C. & F.



Double End 100-ton Electric Crane, Independent of Third Rail or Trolley

Electric Equipment for Steam Railroads

Difficult Operating Problems Are Solved by Electric Trucks, Electric Locomotives, and Electric Welding

LIKE ALL OTHERS in the steam railroad field, electrical men are extremely busy. The present crisis is affording them the opportunity to prove that much electrical equipment is prerequisite for efficient operation. The branches of the electrical field which are now demanding particular attention are shop power and light, handling of freight in terminals, heavy electric traction, and electric arc welding. Car lighting and headlights are subjects which are also demanding recognition. The incandescent lamp has become the standard for locomotive headlights and the greater number of railroads are replacing all other forms of light for coaches with electric light as rapidly as circumstances permit.

Shop Power and Light

The electric motor has long since proved to be the best sort of power for driving machine tools in the railroad shops. At present, repair shops and repairmen for the electric motor equipment are at a premium. This has led in a number of cases to the demand for portable motors to take the place of those in trouble until they can be repaired. These motors employ belts or flexible coupling drive and so far as developed are limited to 15 h. p.

It is generally accepted that anti-friction bearings are the best preventative for motor trouble and their use has simplified maintenance. Attention to lubrication twice a year will suffice to keep them in good condition.

The car repair shop shown in the illustration presents an example of working conditions which can be obtained with proper illumination. Much is being said, and in good cause, about lighting curtailment, but this should be applied to the shop with discretion. It has been shown in a number of cases that burning more light may actually effect a saving of coal. With good light the workman can perform a given piece of work in much less time than he could if the light were inadequate; the motor used to drive the tool which he is working with is used for a shorter period of time and the power consumption of the motor is relatively large as compared with that of the light.

Electric Trucks

The handling of freight in terminals has been the cause of more difficulty than has the shipping of freight over the road. The use of electric trucks has served greatly to reduce the congestion in terminals. A large eastern road reports it would be impossible to handle the transfers of material in the terminal with hand-trucks, even though a sufficient number of trucks and men were available. The reason for this is that the greater amount of space required is not available.

Electric Traction

Those roads with electrified sections have a great advantage, for with electric locomotives as against steam locomotives, almost twice as many cars can be handled over a given amount of track. There are at present four new types of electric locomotives under construction; two of these are being built by the General Electric Company for the Chicago, Milwaukee & St. Paul and the New York Central. The other two are being built by the Westinghouse Electric & Manufacturing Company, for the Chicago, Milwaukee

A Well Lighted Shop

& St. Paul, and the New York, New Haven & Hartford. These four locomotives were described in the *Railway Age*, March 22, 1918.

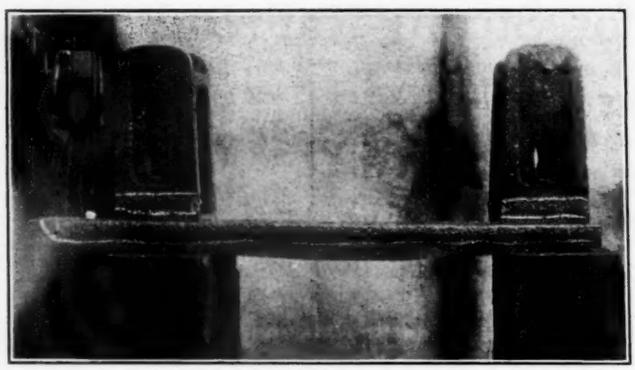
Some interesting information pertaining to maintenance and operating costs was contained in the last annual report of the Norfolk & Western. The average maintenance cost

—including repairs, retirements and depreciation—per 1000 ton-miles for steam locomotives was 32 cents, while that for electric locomotives was only 10 cents. The following statement was contained in the report pertaining to operating costs: "The cost of freight movement in the electric zone in the month of October, 1917, when the conditions were normal, was 26 per cent less than if steam power alone had been used."

Electric Arc Welding

Welding is now demanding more attention than any other branch of the electrical field. It is used effectively on steel and cast-iron, and experiments on other metals, such as bell metal, have proven that the use of arc welding is not limited to iron and steel. Its use on railroads is being steadily extended.

In the locomotive repair shop, arc-welding is used for



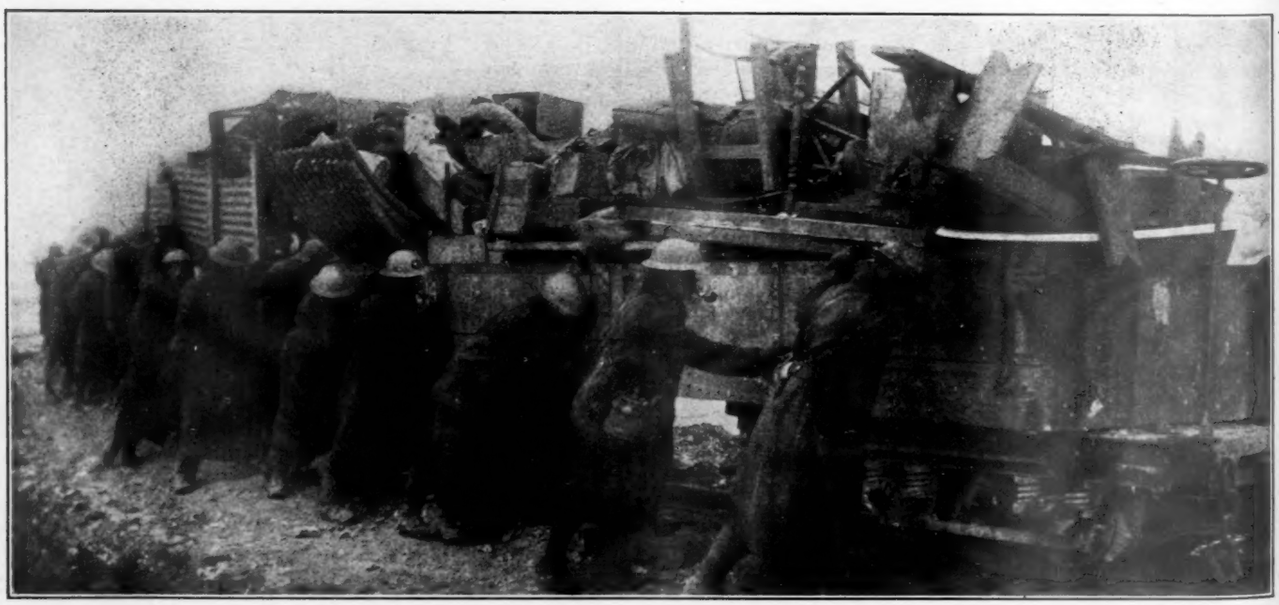
Worn Cross-head Guide Built Up by the Metal Electrode Process of Arc Welding

making almost every kind of repair. Broken locomotive frames are repaired quickly, and with little cost; cracked and broken cylinders are repaired without removing the cylinders from the locomotives; broken fireboxes are repaired; flue sheets are welded into boilers without the use of rivets, and it has become quite common practice to weld the flues to the sheet at the fire-box end of the boilers. The cross-head guide illustrated was worn down until practically useless, and then built up by the metal electrode process. After it has been machined it will be put into service again. This practice is not limited to flat surfaces only but applies

Electric Trucks Can Operate In and Out of Box Cars

equally well to cylindrical forms, which are in need of bushing. Extensive tests have shown that it is possible to make a weld stronger than the original metal. This statement is true for cast-iron as well as for steel.

The savings made possible by the use of electric arc-welding are apparent to anyone who has seen it in use. The superintendent of a large eastern shop recently said that by the use of improved shop methods and electric arc-welding, they had been able to maintain total operating costs constant in spite of the tremendous increases in cost of labor and material.



Central News Photo Service.

Helping a Railroad Out of Its Difficulties

The Shifting of Motive Power From Road to Road

The Practice Leads to Many Difficulties, Some of Which May Be Overcome; Should Be Curtailed

THE PLAN OF TRANSFERRING LOCOMOTIVES from those roads having a surplus of power to those suffering seriously from traffic congestion and power shortage was first considered by the Railroads' War Board. Under the direction of that body, arrangements were made in December for the transfer of 100 locomotives from 20 railroads in the west to a number of eastern lines, the transfer to be carried out through the St. Louis and Chicago gateways. Since the control of the operation of the railroads has been taken over by the President, the application of the plan has been somewhat extended by Director General McAdoo, not without numerous difficulties, but in the main with success, when considered as an emergency measure.

At the present time there are more then 40 railroads in the United States using from one to 75 borrowed locomotives each, which are being paid for on the rental basis of $50 a day. All of these locomotives, however, were not borrowed directly from other railroads. About 200 of them are either Consolidation type locomotives of the design built for our army in France or the Russian Decapod type, some 200 of which are reported as being converted to standard gage by the use of wide tires, and loaned to the railroads by the United States Government. There is also an increasing output of new locomotives delivered on domestic orders, all of which are being taken from the builders and placed in service wherever the greatest needs exist, irrespective of ownership. As announced early in February, this practice was to be followed for the entire output of the builders during January, February and March, amounting in all to about 700 locomotives. It is estimated that about 600 foreign engines from all sources were being operated on April 1.

Locomotives Do Best at Home

Much that has been said about this subject indicates very clearly that to the lay mind any locomotive is a good locomotive anywhere—just as good in California as in Maine. But to those who have directly to do with the operation and maintenance of locomotives they come to be considered almost as much a part of the fixed transportation plant as yards and roundhouses. Whole systems of repair practice and shop organization grow up around the types of locomotives and even details of construction which become more or less standardized on each railroad. Smokebox design and adjustment and grate design are influenced by the characteristics of the fuel in the districts in which locomotives regularly operate. If such locomotives are suddenly replaced by others developed under other conditions, neither the locomotives nor the organizations handling them fit and a considerable amount of adjustment of both is required.

The movement of traffic is of greater importance, however, than either convenience of operation or the greatest efficiency of maintenance. Under the conditions which have been faced by many of the railroads during the past winter it has been imperative that they secure all the motive power that could possibly be made available. In such a situation, on the principle that half a loaf is better than none, railroad men have been willing and even eager to secure locomotives of almost any type from any available source.

Unnecessary Confusion

As the situation stands at the present time, there is apparent a lack of co-ordination in the distribution of the borrowed locomotives which should be remedied. Indeed, the practice of transferring locomotives has now reached a point where there is danger of its being carried to extremes. The railroads operating locomotives foreign to their own line, and hence most affected by the practice, are those in the eastern and southern sections of the country and a few in the southwest. Some of these railroads are operating a miscellaneous collection of one or two locomotives received from each of several other railroads. Conversely, locomotives of the loaning roads are being scattered one or two in a place, when they might better be kept together. There are cases where railroads are receiving foreign locomotives to make up their own shortage of power and are having their own new power scattered about on other railroads. It is possible that there are cases in which each one of these conditions may be justified, but the unhindered practice of such methods is laying the foundation for a tangle later on when the need for repair parts becomes urgent, which will not only be exceedingly annoying, but expensive as well.

Even under the best of conditions there are many difficulties incident to the transfer of locomotives to foreign lines. One of the difficulties is to secure proper material from the owning road with which to make essential running repairs. The most common instance of this is the failure to secure grates, a part of the locomotive very frequently requiring renewals. There are instances where locomotives have been held out of service for as much as 10 days by the borrowing road awaiting grate bars, which had to be secured from the owners. In one case, after the locomotive had been held for some time awaiting material, the defective grates were patched up and the locomotives sent back to the owning road. In another case, the borrowing road, in order to protect itself against such delays, ordered sufficient material from the owning road to seriously cripple the latter's store stock of this material.

All of these difficulties present themselves at the outset of the transfer and, as such transfers are only resorted to as emergency measures, will probably never be wholly eliminated during the comparatively short periods in which the locomotives remain away from home. If the borrowing road is using locomotives from several different railroads, instead of securing them all from one line, it is evident that the difficulties of the situation are multiplied. On the other hand, if the locomotives of the loaning road are scattered over a number of other lines, instead of being kept together on one road, the difficulty of providing the necessary stock for running repairs to protect the borrowing roads is materially increased.

In considering the transfer of locomotives from one railroad to another, the fact should not be overlooked that there is always a tendency for borrowed power to run down. This does not imply any lack of conscientious attention on the part of the officers or men of the borrowing road; it is due to the difficulty of securing needed repair parts and material which must come from the owner, and also to the fact that frequently such locomotives are not adapted to the regular routine methods of handling its own power in force on the borrowing road. In such a case it is a natural consequence that the more popular home locomtives and, therefore, those considered the best, can be kept in service longer with running repairs before requiring a trip to the back shop.

Clearance limitations should never be overlooked when transferring locomotives from one road to another. Some instances which have occurred during the past winter indicate that this important matter has not always received the attention it should. In one such case the clearance limita-

tions on the borrowing road were such that after receiving locomotives from another line, it was found impossible to operate them except in a restricted territory only 50 miles in length. In another similar case it was found that Russian locomotives would not clear a viaduct on the line of the railroad on which they were placed in service, this fact only being determined after the locomotives were placed in service.

Keep the Transfers Within Reasonable Limits

It is evident, therefore, that the practice of transferring locomotives should have rather narrow limitations. One of the first and most important considerations to make the plan successful is to keep the locomotives near the home road, preferably on a line directly connecting with the home road, and on a division directly adjoining the home road connection. If this practice were strictly followed, the difficulty of securing repair parts and necessary material for the maintenance of the locomotives would be very much reduced. Long delays incident to the transportation of the material long distances would be eliminated.

Every effort should be made to keep together the locomotives of each loaning railroad, and, on the other hand, to give each railroad borrowing locomotives, those from as few lending roads as the available number of locomotives which can be spared by the latter roads will permit. This will materially simplify the problem of furnishing and securing material for running repairs and will save what otherwise is more than likely to become a very confused situation; furthermore, it will conserve material stocks. It takes but a very small amount more of stock to protect ten or a dozen locomotives than it does to protect one or two. Obviously, therefore, if a railroad has 10 or 12 of its locomotives loaned, and these engines are in service on a half a dozen other railroads, the calls upon its store stock by the borrowing railroads for material to protect themselves will be much more burdensome than if all of these locomotives were in service on one line and one division.

Finally, one of the most important limitations which should be placed upon this practice is the length of time the locomotives remain away from the home roads. In an emergency the practice can only be adopted as a temporary expedient to effect an improved distribution of motive power until a more permanent equalization can be effected. Every effort should be bent to the end that the locomotives now being used on foreign lines be returned home at the earliest possible moment. With the contemplated control of the placing of orders for the various railroads, or of the distribution of new motive power, the need for the general shifting of motive power from one railroad to another should be past before the advent of another winter. Not unlike the more fixed facilities of the railroads, the locomotive performs its best service on its home system—even within the narrow limits of its own division and in the hands of its own crew. Unlike the car, which is at home anywhere, for best results the locomotive should be maintained as a permanent facility.

Provide Central Direction

In order that the least difficulty should arise from the maintenance and operation of the borrowed locomotives and later from the transfer of these locomotives back to the home roads, all of the details should be co-ordinated in the hands of a single agency. The agency best adapted to handle this situation and the one to which it most logically belongs, is the Locomotive Section of the Railway Administration. The information in the hands of the Manager of the Locomotive Section and his facilities for securing such additional information as may be required, are such that he should be in a position to give each factor entering into every case which presents itself its due weight. Each case may then be settled in its proper relation to all other cases now existing or which may arise Only in this way may the confusion now evident gradually be eliminated and, what is of equal importance, may the locomotive be directed toward the home roads just as rapidly as conditions will permit.

Railroads Need Better Machine Tool Equipment

Must Not Postpone Ordering; Builders Offer Fairly Good Deliveries In Most Cases

DURING THE YEARS immediately preceding the outbreak of the European war, the railroads of the United States spent approximately $12,000,000 annually for shop machinery and tools. In the year 1914 there was a serious falling off in the net operating revenue of the roads, and as a result the expenditures were reduced wherever possible. Consequently only $9,000,000 was spent for machinery and tools during 1915. Throughout the past two years there has been an unusually strong demand for machine tools for war work and the railroads have confined their purchases principally to tools which were urgently needed. Although no general statistics are available, it is safe to say that the expenditures for tools have been even smaller during the past two years than in 1915. With the great advance in prices, a given expenditure of course represents a much smaller amount of shop equipment. Taking this into account and considering also that the roads are handling far more traffic than ever before, it is quite evident that they are in need of a large number of machine tools at present.

Although there has been no reduction in the prices of machine tools, other changes have taken place which should not be overlooked when considering the advisability of making purchases. The past year has brought large wage increases to all classes of mechanics. While in 1915 the total compensation paid by the roads to mechanics, helpers and apprentices was over $90,000,000, for the present year it will probably be 40 per cent higher, or about $125,000,000. There are but few methods that can be used to offset this increase. One that deserves attention is the use of improved machine tools to increase the output per man. Suppose only 2 per cent more output could be secured by providing better tools. Figuring interest and depreciation at the rate of 12 per cent annually this saving would justify the expenditure of more than $20,000,000. All who are familiar with shop conditions will agree that with improved equipment much greater economics could be effected. Aside from the direct saving in labor there would be opportunities for increasing the efficiency of operation by reducing delays and making it possible to get more service from equipment.

During the past winter it was impossible to care for equipment properly at some points, due largely to the inadequacy of the roundhouse facilities. The machine tool equipment of engine terminals is usually made up of tools that have outlived their usefulness in the shop and should have been sent to the scrap pile instead of to the roundhouse, where minutes lost in doing machine work may result in costly delays.

The need of first-class tool equipment in roundhouses has been recognized for some time. One superintendent of mo-

tive power recently stated that he thought with the large locomotives now in use requiring frequent heavy work, every roundhouse should have a few pits equipped for handling heavy repairs in order that the heavy roundhouse jobs could be taken care of promptly. The necessity for keeping down the expenditures has prevented roads from buying the equipment they have required in the engine houses. Better facilities at these points will help to prevent such costly congestion as occurred last winter, and should certainly be provided.

Although the machine tools most urgently needed are those required for roundhouse work, many shops should have additions for their equipment, or replacements for obsolete tools. There are wide variations in the conditions on different roads. Some have followed a consistent policy of buying shop machinery regularly as additional rolling stock was secured. On other roads the repair facilities are not sufficient to take care of the equipment under the present conditions. It is, of course, advisable to have all locomotives repaired on the home road if possible. While it may not be feasible to build additional shops at this time, the capacity of existing shops is usually limited, not by the number of pits but by the machine facilities and in most cases a few tools, judiciously chosen, will make it possible to increase the output considerably.

The question of providing good repair facilities is of such importance that it should receive first consideration when ordering tools. Under the present conditions, however, the reclamation of materials offers such unusual opportunities for reducing expenses that it may be found advisable to include a considerable amount of machinery in the tool program for such work. As specific instances of equipment that is being reclaimed to good advantage at this time flues, rails and bar iron may be mentioned.

Granting that the roads need a great many machine tools at this time, the question of their ability to secure them naturally suggests itself. There seems to be a general opinion among railroad men that tools of all classes are hard to get and deliveries are very slow. While it is true that in the past there have been delays in securing tools, the situation has improved and reasonable deliveries are now being promised on practically all types of machines.

Before going into the subject more in detail, it may be well to give a short account of the work of the machine tool section of the War Industries Board. Although an advisory body without executive authority, the board has done much good in directing the manufacture and distribution of machine tools. A schedule of production was secured from every shop and from the data furnished it was determined whether the production of various machines was greater or less than the demand. This made it possible to commandeer tools with the minimum of inconvenience to private industries. The requirements of munition plants are being estimated and a reserve of tools set up for such work. Companies which formerly did not manufacture machine tools have been induced to enter the field, thus increasing the production of machines that were badly needed. By preventing speculation in machine tools the board has helped to keep the prices on a reasonable basis. While there has been some costly duplication of facilities, the production and the demand have been controlled as much as possible and the conditions are fast becoming normal.

The commandeering of tools for government work has not interfered with the delivery of tools to railroads to any great extent. Since the roads are now under government control they will probably be given preference in arranging for priority of orders. Some of the tools which the railroads use in large number can now be delivered from stock, and nearly all can be secured within six months from the date ordered. In fact the only classes of equipment on which deliveries are much slower than usual are the extremely heavy tools and special equipment of which small numbers are built.

Information received from the manufacturers of tools indicates that the conditions as regards deliveries are at the present time about as follows:

Good Deliveries in Most Cases

Lathes: A few of the smaller sizes can be delivered from from stock. On the larger sizes deliveries vary from two to seven months depending on the swing and length of bed. It is almost impossible to secure wheel lathes, as plants equipped to manufacture large tools are devoting all their time to working on government orders.

Turret lathers: All sizes and types can be furnished in from two to five months' time.

Boring mills: With the exception of the larger sizes used for tires and wheel centers, deliveries can be secured in from two to three months. The larger machines are not available at this time and probably cannot be secured for some time to come.

Planers: No class of equipment has been more in demand than large planers. The urgent need for these tools for war work has led to the introduction of a new type of machine which has a concrete base. The medium and smaller sizes can be secured in from four to twelve months, however.

Milling machines: Deliveries of the ordinary sizes of plain and universal milling machines can be made within six to twelve months, while for heavy milling machines the time is somewhat longer.

Shapers: Deliveries vary from four to eight months.

Drill presses: Sizes up to six feet can be secured in from three to eight months; on radial drill presses and on the other types the time required is even shorter.

Cylindrical and surface grinding machines: Small stocks of some sizes are on hand and other machines can be supplied in from two to eight months.

Portable tools: All types and sizes can be furnished within two months from the date ordered.

Electric welding equipment: Deliveries can be made in from one to three months.

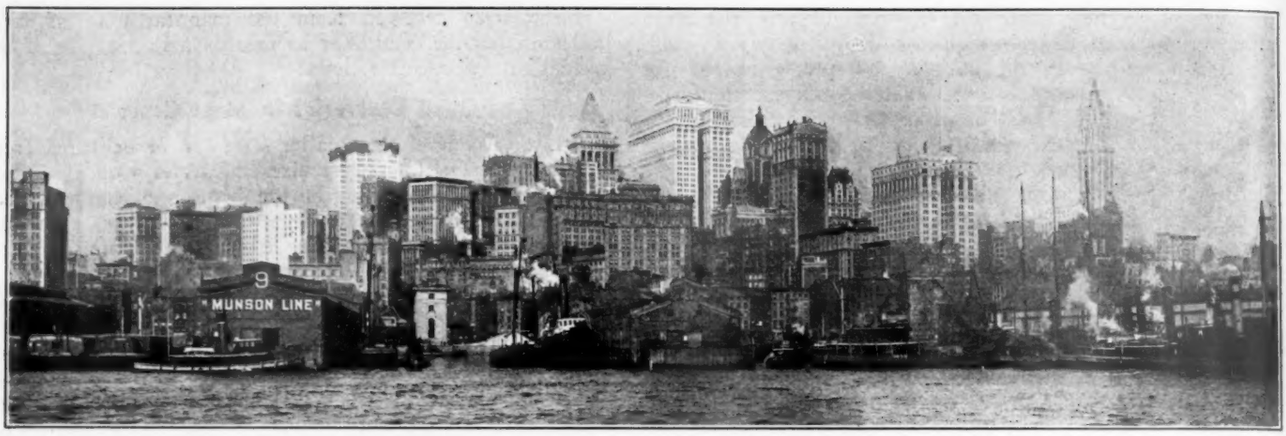
Electric motors: All sizes required for driving machine tools can be furnished within two months.

Blacksmith and boiler shop equipment: Steam and power hammers can be supplied in from two to four months, forging machines in six months and bolt machinery in three to five months. Deliveries of punches and shears can be made within one month; flangers are available within four months.

Wood working machinery: Deliveries are practically normal, one to three months being required to fill orders depending on the type of machine wanted.

From the data given above it is evident that while some difficulty might be experienced in securing complete equipment for new shops owing to the great demand for certain types of machines, the ordinary requirements can be met with but little delay. Machine tool prices are stable and there is no longer any thought of postponing buying in anticipation of a possible decrease in prices. The railroads have everything to lose and nothing to gain if they restrict their orders for machine tools. With labor costs continually rising, they have every inducement for replacing the old equipment with modern machine tools. The roads must operate at the highest efficiency in order to handle the present enormous traffic. Better shop equipment will help them to realize that aim. Their purchases in the past three years have been entirely inadequate, but this year the roads should make up for it and should place larger orders for machine tools than duing any previous year.

A Bridge to Connect Europe with Asia.—According to the Vossiche Zeitung the Turkish government has introduced in the Chamber a bill asking for a credit for the examination of the question of the construction of a bridge or tunnel connecting Europe with Asia.



New York Is Urgently Recommended for a Free Port District.

Is the Supply Field Interested in "Free Ports"?

Apparently the Idea Will Have No Advantages for the Manufacturers of Railway Materials

By E. S. Swazey

THE QUESTION OF THE DESIRABILITY for the United States of free ports—districts set outside of the jurisdiction of the customs into which foreign merchandise may be brought for storing, handling, manufacture and re-export—has been the subject of more or less discussion, particularly during the last few months. The United States Tariff Commission has conducted hearings in several cities for the purpose of finding out how useful these free ports would be in developing our foreign commerce; and legislation has been introduced in Congress providing for free ports.

The interest of railwaymen centers largely in the part that these free ports would play in the whole problem of port development, particularly at New York.

It is, however, not probable that free ports would prove of any special assistance to the manufacturer of railway equipment and supplies, for the reason that his raw materials are entirely domestic. They might, on the other hand, even prove to his disadvantage, by way of being of greater assistance to the foreign manufacturer of these products in facilitating his sales to, for example, the Latin American countries.

The free port problem is, nevertheless, one of fundamental interest to those whose attention is turning to foreign trade and one about which far too little is known as to its practical adaptability to existing and probable future conditions in this country. The very fact that the minds of the leaders in the railway supply field are turning to a discussion of the new problems of the day is the best reason why a discussion of the arguments for and against the free port should be of interest to railway supply men.

Definition

A free port has been defined as a district in or adjacent to a port, within which the customs authorities do not enter but confine their activities to guarding its boundaries and imposing the usual formalities and charges upon all goods which leave it for the interior. It is designed to counteract the restrictive effects of customs supervision and at the same time retain all the protective and revenue-producing features of the tariff system. It usually consists of a large district, isolated from the remainder of the port by natural or artificial barriers, equipped with wharves, warehouses, industrial locations and mechanical devices for the economical handling and transportation of merchandise. It is a district which all ships, irrespective of flag or cargo, may enter and depart from unmolested and where all sorts of activity in commerce and industry, including sorting, refining, grading, mixing, assembling, manufacturing and selling may be carried on without customs charges, supervision or formalities. The territory set aside as a free port is intended to be a great market and the center for the transshipment trade of the region.

The value of a free port district bears a direct relation to the extent of tariff restrictions existing in the country in which the district is located. Recent discussion of the desirability of free ports for the United States seems to have very largely omitted any detailed consideration of what part of our trade would be benefited by such an arrangement.

Hamburg Glibly Cited

The example of Hamburg is glibly cited to show the benefits that accrue from the establishing of a locality in which merchandise may be stored, handled, manufactured, or reshipped without the inconvenience of customs regulation. The Hamburg free port has been undoubtedly successful, but Germany has a high protective tariff.

On the other hand, England, a free trade country, has in Liverpool and London, two of the greatest transshipping ports of the world, and handles successfully through her bonded warehouse system, dutiable commodities, such as tea and similar luxuries.

Between these two extremes lie the conditions existing in the United States—raw materials, very largely free of import duty, semi-finished and manufactured goods, more or less subject to a duty that is partly protective, and partly for the purpose of revenue.

Three Fundamental Conditions

Three other fundamental conditions must be borne in mind in a consideration of the problem, particularly if undue emphasis is not to be laid on the success of the European free ports:

First, the great bulk of the raw materials entering into our manufacturing are of domestic origin (this applies to our in-

creasing production for export as well as to production for our own needs and includes particularly railway materials) and that of those materials that are of foreign origin, a large part comes in free of duty;

Second, we are located geographically not only at considerable distance from the sources of important foreign raw materials, but we are also far from any foreign consuming markets with such concentrated purchasing power as exists in the foreign markets nearby Hamburg;

Third, our extensive coast line, though it has the one predominating port of New York, has also a large number of smaller ports competing among themselves even now for a share in the free port privilege, which, if granted liberally—as it would have to be or not at all—would, by decentralization, lessen the benefits that might otherwise be gained by one large trade center.

The idea of making the United States less dependent on the European transshipment raw material markets, and even of setting up such marketing centers in this country to which other nations will come as we have gone to them, is now very vital. Possibly, with our enlarged merchant marine, greater financing power and increased prominence in foreign fields, we may be able to overcome the handicap of distance and the inertia of established trade channels, and obtain some of the results desired. How would the establishing of free ports assist in this development?

Free and Dutiable Merchandise

Tables I and II show the relations that exist between free and dutiable merchandise as grouped into six classifications for the last six years. The first three of these years (ending June 30) are pre-war. The first two years, 1912 and 1913, represent imports under the old Payne-Aldrich tariff. The figures for 1914 show clearly the effects of the new tariff, although industry can hardly be said to have adjusted itself to the new rates of duty. The effects of the war during the last three years are also to be borne in mind, though they do not materially alter the conclusions to be drawn.

TABLE I—PERCENTAGE OF DUTIABLE MERCHANDISE IN EACH GROUP OF UNITED STATES IMPORTS

	Years Ending June 30					
	1912	1913	1914	1915	1916	1917
Crude materials for use in manufacture	20.6	19.8	13.2	11.9	10.2	9.1
Foodstuffs in crude condition and food animals	21.8	15.1	18.6	12.1	13.8	19.9
Foodstuffs partly or wholly manufactured	91.5	94.4	83.7	82.1	88.3	88.1
Manufactures for further use in manufacturing	47.8	48.3	37.1	31.8	28.4	24.3
Manufactures ready for consumption	78.4	76.2	71.6	68.2	61.4	57.5
Miscellaneous	26.01	34.1	35.2	35.3	34.6	37.3
Total	46.7	45.5	40.5	38.3	32.1	30.5

Table I shows for each of the years the percentage of the imports in each of the groups of merchandise that is dutiable. "Foodstuffs partly or wholly manufactured" is the group in which the greatest percentage is dutiable, ranging fom 94.4 per cent in 1913 to 82.1 per cent in 1915. The next group in point of proportion of dutiable merchandise is "manufactures ready for consumption." Of the "crude materials for use in manufacturing" group, which in total volume of trade as well as in point of free port interest is of most importance in this analysis, the percentage of dutiable imports was but 20.6 per cent and 19.8 per cent in 1912 and 1913, and under the new tariff dropped to 10.2 per cent and 9.1 per cent in 1916 and 1917.

Table II shows for each of the years the percentage of dutiable imports in each group to the total of the imports of all groups, both dutiable and free, in order to show the relative importance of the dutiable imports, to a small part of which a free port would cater, to our total import trade. Bearing in mind the argument that free ports would be of material assistance to the manufacturer preparing goods for export, note that dutiable crude materials and dutiable manufactures for further use in manufacturing, each run under the new tariff only between 4 per cent and 5 per cent of our total imports. Even with a remarkable development of our export trade, the part of these dutiable materials that would enter into our exports would be a very negligible quantity.

Free ports may, of course, be used for the handling of merchandise that is not subject to duty. A steamer bringing both dutiable and non-dutiable goods might use the facilities of a free port for both classes of goods. Any free port districts that would be developed would probably be very modern in equipment and as low in charges as existing facilities, so that the district might attract a merchandise movement considerably in excess of the amount of dutiable merchandise that would actually benefit by the absence of customs restrictions and which would not be a full measure of the use that would be made of the districts. But this suggests the more important problem of the proper development of the entire port and terminal facilities of our seacost, irrespective of whether or not free ports are permitted. As a matter of practical operation, it would be very difficult to import the small proportion of actual free port merchandise in the relatively few vessels that would discharge in the free port districts.

TABLE II—RATIO OF THE DUTIABLE IMPORTS IN EACH GROUP TO THE TOTAL OF ALL U. S. IMPORTS

	Years Ending June 30					
	1912	1913	1914	1915	1916	1917
Crude materials for use in manufacture	6.9	6.9	4.4	4.1	4.4	3.8
Foodstuffs in crude condition and food animals	3.0	1.8	2.4	1.6	1.5	2.5
Foodstuffs partly or wholly manufactured	10.9	10.1	10.1	14.0	12.5	11.4
Manufactures for further use in manufacturing	8.5	9.3	6.2	4.5	4.6	4.4
Manufactures ready for consumption	17.1	17.1	16.9	13.7	8.8	8.2
Miscellaneous	0.2	0.3	0.3	0.4	0.3	0.2
Total	46.6	45.5	40.5	38.3	32.1	30.5

A Free Port's Activities

The activities of a free port fall in two main categories, re-exporting merchandise largely in the form in which it is imported, and manufacturing for export products of which imported materials form a part. It would seem from the above figures that only a limited use would be made of free port facilities for manufacturing purposes, although inquiry may develop specific industries whose use of imported dutiable raw or partly manufactured materials in products for export would warrant their taking up manufacturing quarters in a free port zone. The re-export of foreign merchandise, with which a free port would apparently be most concerned, is then to be considered.

TABLE III—IMPORTS AND RE-EXPORTS OF FOREIGN MERCHANDISE

	Total Imports	Total Re-Exports	Ratio Re-Exp. to Imports	Re-Exports from Bonded Warehouses	Ratio to Total Re-Exp.
1912	$1,653,264,934	$34,002,581	2.1	$10,585,800	31.1
1913	1,813,008,234	37,377,791	2.1	12,142,113	32.5
1914	1,893,925,657	34,895,123	1.8	10,514,106	30.1
1915	1,674,169,740	52,410,875	3.1	12,289,008	23.4
1916	2,197,883,510	61,305,306	2.8	*	....
1917	2,659,355,185	63,036,795	2.4	*	....

* Not reported.

Table III gives an indication of what has been done under the existing bonded warehouse system. The percentage of total re-exports to imports is small, although the war has increased both the percentage and the actual amount. The portion of these re-exports representing merchandise dutiable when imported cannot be ascertained exactly. An indication is seen in the re-exports from bonded warehouses, which have been about 30 per cent of the re-exports. Or if we take the same proportion that is dutiable when imported, the amount

which would be available for free port handling has apparently been worth about $20,000,000 in 1916 and 1917. The existence of free ports would facilitate this transshipment movement. Let us see what commodities would be favorably affected by such a plan.

The world's great commodity markets in London, Liverpool, Rotterdam, Hamburg and other European ports are those of raw materials such as rubber, cacao, coffee, cotton, silk, jute, and tea. Hope has been expressed that the United States would become the distributing center for one or more of these products—say rubber, coffee, and cacao—but free ports would hardly help in this development, since each of these commodities now enter free of duty, and except possibly for the formality of "entering," which would be necessary even in a free port for record purposes, and except for certain sampling, are not handicapped by customs regulations.

Easier Means to Secure Same Results

Even if these raw materials were dutiable, the difficulties of bonded warehouses and drawbacks could be more easily overcome than the more dominating factors in determining world markets of geographical location, established channels of trade, financing and insurance, and our own lack of world trading knowledge.

The most important of the commodities re-exported that are subject to import duty are: Antimony, chicle, jute manufactures, dried peas, precious stones and imitations of, cleaned rice, sugar, and leaf tobacco, of which the total value of the re-exports in 1916 was about $10,000,000.

With free ports, the amount of dutiable commodities re-exported would, of course, be greater, and in considering the desirability of such districts, it is not entirely fair to measure their value by the experience recorded under customs conditions, which the ports would eliminate.

A list is given below of the most important raw and partly or wholly manufactured materials that are imported into the United States subject to duty in order to call them definitely to the attention of those who, under free port conditions, might import these products for re-export to other countries. Note the absence of railway materials.

Raw Materials		
Aluminum	Antimony	Breadstuffs
Argols and wine lees	Glycerin	Camphor—crude, natural
Chicle	Indigo—natural	Licorice root
Vanilla beans	Feathers	Fruits and nuts
Lead	Olive oil	Precious stones (unset)
Flaxseed or linseed	Spices	Sugar
Tobacco	Zinc	

Materials Partly or Wholly Manufactured		
Flour	Silk and woolen mfgrs.	Laces, embroideries, etc.
Dyes, chemicals, drugs, etc.	Bristles	Furs—dressed and mfgrs. of
Earthen, stone, and chinaware	Cotton thread and yarn	
	Mfgrs. of fibers	
	Brushes	

What in general are the trade movements in which the United States could figure to any extent as a distributing center? Geographical location to ensure the shortest distance between producer and consumer is an important factor, although there are notable exceptions, such as the tea and rubber movement through England. Even granted the shorter distance, steamship lines or the tramp movement of ships must create new channels.

First, there is the possibility of the distribution of European products via the United States to Latin-America (particularly to the Caribbean and West Coast countries, as little movement to Brazil and the Argentine could be expected via New York), and the return movement of raw materials from Latin-America.

Second, there is similarly a possible trade channel via our Pacific ports between the Far East and the Latin-American countries.

Third, there is the exchange of European with Far Eastern products via this country, insofar as this might compete with the direct move via the Suez.

It would be very desirable to possess the controlling markets of raw materials, such as rubber, which this country does not produce, and particularly those that enter largely into our requirements. But as has been noted, these are for the most part free of duty, and would be benefited by free ports only to the extent to which these ports might assist in developing the desired new trade channels.

Raw materials which the country does produce and which are dutiable, such as rice, wheat and other breadstuffs, sugar, tobacco, and certain vegetable oils, would be directly benefited to the extent that the free port system would release the transshipper—agent, refinery, factory—from the burden of red tape and attendant expenses. Though, as Irving T. Bush has suggested, the simpler remedy here would lie more naturally in an overhauling of the present bonded warehouse and drawback systems.

Materials required in the manufacture of merchandise which we would be able to sell abroad would be advantageously handled through free ports where these materials are either not available in this country or are in insufficient quantity. To what an extent these would enter into our growing export trade in manufactured articles it is difficult to determine from data available—probably only in relatively small amounts.

The Danger in Free Ports

The transshipping of foreign manufactured articles to the possible detriment of our own manufacturers would seem to require most careful economic consideration. A free port would not, of course, do more than simplify a trade movement now fully possible. But it might prove to be a deciding factor in a competition between a United States and a foreign manufacturer in the sale of goods to a country in which the foreign seller did not have direct sales or shipping connections. To take a very possible case as an example—suppose that a group of European railway supply manufacturers, availing of the facilities of a United States free port, were to have in stock there a complete line of their products, any selection from which could be offered to a foreign buyer—say from the west coast of South America. (Goods in bonded warehouses, where this merchandise would now be stored, may only be removed intact in the lots in which it is entered.) The foreign manufacturer would then have an equal advantage with our manufacturer in point of quick delivery.

Free port legislation would apparently be of benefit only to a small part of our foreign trade, and that part certainly does not include railway supplies. Suppose, however, that those few who would be directly benefited were to make their case sufficiently strong to warrant the support of those who would have no real use for the facilities. The legislation might conceivably be passed on the basis that every encouragement, however slight, should be given to our foreign trade. What might be the working out of the plan?

Certain benefits do accrue to the immediate locality in which a free port is located—the manufacturing interests attract labor in addition to the necessary dock labor, and real estate values appreciate; the movement of ships and their cargoes, with attendant expenses, and the banking, insurance, and other trade features are at least of local benefit. If the number of free port districts is restricted, the competition for these districts on the part of local chambers of commerce would undoubtedly open the way for political preferment and dissatisfaction. If the number is not restricted—in view of the necessarily expensive customs guard around each district, this is hardly conceivable—the benefits that might be gained by one, two, or even three large ports would with a larger number be "spread so thin" that they would not be worth while.

New York stands out pre-eminently as a location for one of the ports, should it be proved that they are of advantage to the country as a whole. Criticism has been expressed of

the already congested condition of the port, but the fact nevertheless remains, that the port handling 50 per cent of the United States imports is the natural radiating point for steamship lines to and from the greater part of the world, and that the selection of any smaller port on the Atlantic would be an attempt to divert trade much further from its natural channels than we are already trying to do in our attempt to establish the United States as a transshipping country in competition with England and Germany. Proper port development would allow a free port district to be accommodated.

Possible Free Ports

In addition to New York, one district, if the tariff commission finally recommends the free port idea and Congress passes it, would probably be of advantage on the Pacific Coast, and another on the Gulf. Neither of them would be large; each would cater to a relatively small number of commodities.

Dock Commissioner Hurlburt of New York has remarked that the protectionists in Congress are against the free port idea because they think it will let materials in free of duty; the free traders are opposed to it because it presupposes the continuance of tariffs. In general, there is a very great lack of public understanding as to what free ports are intended to do, and how much they will be able to accomplish for the benefit of our foreign trade. Many have spoken in favor of the idea, some of them, it must be stated, without a very clear conception of the volume of our trade that would be affected. And certain importers whose raw materials are not subject to duty and who would, therefore, be only directly benefited, have urged the ports apparently on the ground that some time their commodities might be made dutiable. A very few, among them Mr. Bush, have expressed disapproval of the idea instead of taking for granted the general and unconfirmed statement that "it would be a good thing for the country, and, therefore, I am in favor of it."

If most of our merchandise were subject to duty, free ports would probably be a good thing for the country; if under existing tariffs it can be proved that it would be of enough use to the country, it would to that extent still be a good thing. But the burden of proof does very definitely lie with those who would make use of the facilities. Unless the tariff commission has already done so, the next step would appear to be a thorough referendum among those who would be affected to determine how much the free ports could be used on the basis of present trade tendencies. This would seem to be more productive of tangible results than any number of hearings.

The hearings held this past winter in various cities were advantageous in that they represent a part in the necessary campaign of education as to the functions of a free port. Such a campaign should be carried on in any event. But the remarks at the New York hearing were very general indeed, seeming to lack entirely any concrete data as to who and what would be benefited. Until the tariff commission or some other body can give us more definite facts, let us not be so hasty in urging free port legislation as the great panacea with which to develop foreign trade.

Freight Operations Under the Railroads' War Board

Remarkable Seven Months' Record, Partly Neutralized by Intolerable Conditions in November

DURING THE NINE MONTHS April to December, 1917, the railroads of the United States moved 9.8 per cent more ton miles of revenue freight than during the corresponding period of 1916 with an increase of only 1.1 per cent in the average number of freight locomotives in service and of only 2.9 per cent in the number of freight cars. This period covers that part of the year after the United States declared war against Germany and corresponds closely with the period during which the railroads were operated under the general direction of the Railroads' War Board.

The war board was organized at a meeting in Washington on April 11. For the purpose of recording the results obtained from its campaign for increasing the efficiency of the American transportation system it inaugurated a series of monthly reports of freight operations containing information which formerly was not available except in annual statistics. These reports were compiled by the Bureau of Railway Economics and that for the month of December, with a combined summary for the nine months, has recently been issued, as noted in last week's issue.

The combined report for the nine months, which is reproduced herewith, is of special interest as an indication of the results accomplished by the roads under the direction of the War Board. It covers the operation of 227,651 miles of line, or about 98 per cent of the operated mileage of Class 1 roads.

The primary purpose of the Railroads' War Board was to increase the efficiency of the roads to enable them to handle the maximum of freight with the available facilities; and to accomplish this purpose it devoted its efforts largely to obtaining a heavier loading of cars, the maximum tonnage per train, the elimination of delays in loading and unloading of cars, greater mileage per car and per locomotive per day and an increase in the available transportation capacity by proper attention to repairs of cars and locomotives.

During the nine months' period under its direction the railroads represented in the table handled 303,751,995,337 ton miles of revenue freight, which is more than the entire revenue traffic of all the roads for any preceding full year except the record year 1916. In the calendar year 1916 the total for the Class 1 roads was 362,134,291,397 and in the year ending June 30 it was 339,883,189,699, but the largest previous total was 301,398,752,108 in 1913. The freight earnings in the calendar year 1916 were 19.1 per cent greater than in 1915.

The table also shows how the increase was accomplished. The average tonnage per train was increased from 624 to 667, or 6.9 per cent and the tonnage per loaded car was increased from 25 to 27.3, or 9.2 per cent. The average mileage per locomotive per day was increased from 66.6 to 67.9, or 2 per cent, but the average miles per car per day decreased 1.8 per cent, from 27.3 to 26.8, so it is apparent that most of the net increase in efficiency resulted from the campaign in which the shippers co-operated for heavier loading of cars.

When examined in comparison with the earlier monthly reports the table also shows the effect of the increasing congestion of freight during the later months of the year in the eastern district which resulted from the confusion caused by indiscriminate use of preference orders and the concentration of export freight at a few North Atlantic ports. The decrease in miles per car per day for the nine-months period is the result entirely of the conditions on the eastern lines, where the reduction was 5.5 per cent. The southern lines

showed an increase of .9 per cent and the western lines of .3 per cent.

For the six months, April to October inclusive, the increase in revenue ton miles handled had been 14 per cent, and there had been an increase in miles per car per day of 2.2 per cent.

The average mileage per locomotive per day had also increased by 4 per cent. But the report for October and seven months showed decreases in the mileage per car and per locomotive. In both of these items the best record was shown in the month of May, when average mileage per locomotive per day reached 71.3 and the mileage per car per day was 29.6. In October the mileage per locomotive per day was as high as 69.8 but by December it had fallen off to 61.6. In December the mileage per car per day had fallen to 21.3 and in the eastern district to 16.7 as compared with 21 in December, 1916.

These figures illustrate how the remarkable record made during the first six months was to a considerable extent offset by the conditions of October and particularly of November and December.

In April the revenue ton miles moved showed an increase of 17 per cent over April, 1916. In May the increase was 16.1 per cent, in June 23.2 per cent and in July 20.2 per cent. By August, however, the increase had fallen to 8.4 per cent, in September to 2.9 and in October it was 5.3. In November there was an increase of only 2.9 per cent and in December there was an actual decrease of 2.6 per cent. The reduction in the rate of increase is partly attributable to the fact that the figures for the later months are in comparison with the period of 1916 when traffic was increasing in volume.

FREIGHT TRAFFIC OF STEAM RAILWAYS, NINE MONTHS, APRIL TO DECEMBER, INCLUSIVE; 227,651 MILES

Item	United States 1917	United States 1916	United States Increase or decrease Amount	United States Increase or decrease Per cent	Eastern District 1917	Eastern District 1916	Eastern District Increase or decrease Amount	Eastern District Increase or decrease Per cent
Freight train-miles	495,283,718	482,658,258	12,625,460	2.6	197,164,004	199,405,169	d 2,241,165	d 1.1
Loaded freight car-miles	12,111,872,171	12,044,012,010	67,860,161	0.6	5,175,958,224	5,316,671,396	d 140,713,172	d 2.6
Empty freight car-miles	5,198,351,893	5,117,331,282	81,020,611	1.6	2,306,158,415	2,418,830,973	d 112,672,558	d 4.7
Total freight car-miles—loaded and empty	17,310,224,064	17,161,343,292	148,880,772	0.9	7,482,116,639	7,735,502,369	d 253,385,730	d 3.3
Freight locomotive-miles	585,913,786	568,518,367	17,395,419	3.1	259,261,771	258,964,825	296,946	0.1
Revenue ton-miles	303,751,995,337	276,555,311,578	27,196,683,759	9.8	144,162,071,967	133,926,014,025	10,236,057,942	7.6
Non-revenue ton-miles	26,734,764,949	24,717,751,382	2,017,013,567	8.2	8,478,053,202	7,362,343,277	1,115,709,925	15.2
Average number of freight locomotives in service	31,367	31,028	339	1.1	13,285	13,202	83	0.6
Average number of freight locomotives in shop or awaiting shop	4,320	4,667	d 347	d 7.4	1,927	2,029	d 102	d 5.0
Average number of freight cars in service	2,348,898	2,282,189	66,709	2.9	1,218,457	1,192,433	26,024	2.2
Average number of freight cars in shop or awaiting shop	134,246	139,674	d 5,428	d 3.9	72,751	74,210	d 1,459	d 2.0
Home	101,531	111,077	d 9,546	d 8.6	54,569	58,806	d 4,237	d 7.2
Foreign	32,715	28,597	4,118	14.4	18,182	15,404	2,778	18.0
Tons per train	667	624	43	6.9	774	709	65	9.2
Tons per loaded car	27.3	25.0	2.3	9.2	29.5	26.6	2.9	10.9
Average miles per locomotive per day	67.9	66.6	1.3	2.0	71.0	71.3	d 0.3	d 0.4
Average miles per car per day	26.8	27.3	d 0.5	d 1.8	22.3	23.6	d 1.3	d 5.5
Per cent of empty car-miles	30.0	29.8	0.2	0.7	30.8	31.3	d 0.5	d 1.6
Per cent of freight locomotives in shop or awaiting shop	13.8	15.0	d 1.2	d 8.0	14.5	15.4	d 0.9	d 5.8
Per cent of freight cars in shop or awaiting shop	5.7	6.1	d 0.4	d 6.6	6.0	6.2	d 0.2	d 3.2
Revenue ton-miles:								
Per freight locomotive	9,683,808	8,913,089	770,719	8.6	10,851,492	10,144,373	707,119	7.0
Per freight car	129,317	121,180	8,137	6.7	118,315	112,313	6,002	5.3
Average miles operated—single track	227,651.17	227,432.32	218.85	0.1	58,024.84	58,196.40	d 171.56	d 0.3

d Decrease.

Item	Southern District 1917	Southern District 1916	Southern District Increase or decrease Amount	Southern District Increase or decrease Per cent	Western District 1917	Western District 1916	Western District Increase or decrease Amount	Western District Increase or decrease Per cent
Freight train-miles	89,579,873	83,351,045	6,228,828	7.5	208,539,841	199,902,044	8,637,797	4.3
Loaded freight car-miles	2,027,373,856	1,949,046,508	78,327,348	4.0	4,908,540,091	4,778,294,106	130,245,985	2.7
Empty freight car-miles	953,110,222	865,317,073	87,693,149	10.1	1,939,083,256	1,833,183,236	105,900,020	5.8
Total freight car-miles—loaded and empty	2,980,484,078	2,814,363,581	166,120,497	5.9	6,847,623,347	6,611,477,342	236,146,005	3.6
Freight locomotive-miles	98,568,060	91,636,494	6,931,566	7.6	228,083,955	217,917,048	10,166,907	4.7
Revenue ton-miles	51,691,542,697	46,101,539,024	5,590,003,673	12.1	107,898,380,673	96,527,758,529	11,370,622,144	11.8
Non-revenue ton-miles	4,928,382,092	4,426,221,697	502,160,395	11.3	13,328,329,655	12,929,186,408	399,143,247	3.1
Average number of freight locomotives in service	5,456	5,376	80	1.5	12,626	12,450	176	1.4
Average number of freight locomotives in shop or awaiting shop	655	683	d 28	d 4.1	1,738	1,955	d 217	d 11.1
Average number of freight cars in service	325,580	310,088	15,492	5.0	804,861	779,668	25,193	3.2
Average number of freight cars in shop or awaiting shop	16,836	19,526	d 2,690	d 13.8	44,659	45,938	d 1,279	d 2.8
Home	12,896	16,168	d 3,272	d 20.2	34,066	36,103	d 2,037	d 5.6
Foreign	3,940	3,358	582	17.3	10,593	9,835	758	7.7
Tons per train	632	606	26	4.3	581	548	33	6.0
Tons per loaded car	27.9	25.9	2.0	7.7	24.7	22.9	1.8	7.9
Average miles per locomotive per day	65.7	62.0	3.7	6.0	65.7	63.6	2.1	3.3
Average miles per car per day	33.3	33.0	0.3	0.9	30.9	30.8	0.1	0.3
Per cent of empty car-miles	32.0	30.7	1.3	4.2	28.3	27.7	0.6	2.2
Per cent of freight locomotives in shop or awaiting shop	12.0	12.7	d 0.7	d 5.5	13.8	15.7	d 1.9	d 12.1
Per cent of freight cars in shop or awaiting shop	5.2	6.3	d 1.1	d 17.5	5.6	5.9	d 0.3	d 5.1
Revenue ton-miles:								
Per freight locomotive	9,474,256	8,575,435	898,821	10.5	8,545,729	7,753,234	792,495	10.2
Per freight car	158,768	148,672	10,096	6.8	134,058	123,806	10,252	8.3
Average miles operated—single track	41,950.30	41,733.22	217.08	0.5	127,676.03	127,502.70	173.33	0.1

d Decrease.

COAL EXPORTATION AGREEMENT BETWEEN CENTRAL POWERS.—According to an article published in the Bohemia, at Prague, it was agreed at a meeting held in Berlin between the German, Austrian, and Hungarian coal distribution officials, that for the months of March and April there shall be sent monthly to Austria a total of 572,500 tons of coal and coke from Silesia, and to Hungary 243,500 tons. In return, 275,000 tons of brown coal from the northwest Bohemian fields and 8,000 tons of hard coal from the Kladno and west Bohemian fields are to be sent to Germany.

Motive Power Conditions During the Past Winter

A Shortage of Locomotives Aggravated by Causes Mainly Produced by Weather Conditions

PROBABLY THE ONE THING to which the inability of the railroads to meet fully the extraordinary demands which have been placed upon them during the past winter has been attributed most commonly is a shortage of locomotives. There has been a shortage of motive power and undoubtedly this has been due partly to an actual shortage of locomotives. It is true, however, that much of the difficulty which has been attributed to a shortage of locomotives, has been due directly or indirectly to conditions which more locomotives could not have overcome.

A study of the orders for locomotives placed annually during the last decade indicates that there is an actual shortage of locomotives. A comparison of the number of locomotives ordered during the years 1909 to 1913, inclusive, with the growth of traffic and locomotive mileage performance during those years, indicates that the orders were about normal. The average orders placed during that period were for about 3,600 locomotives per year, while in 1914 orders were placed for but 1,265 locomotives, and in 1915 for 1,612 locomotives. An improvement was shown in 1916, when about 2,900 locomotives were ordered, but the number fell off again by about 200 locomotives in 1917.

While the number of locomotives ordered in 1914 and 1915 was very small, it was not an undue reduction when considered in comparison with the actual business handled during those years. But it left the railroads unprepared, for the sudden and rapid increase in traffic which began during the fiscal year 1916 and has continued ever since, and the exceedingly slow deliveries which have been the general rule since have given the roads little opportunity to catch up. Furthermore, the conditions are not fully indicated by a study of data applying to the country as a whole, owing to the fact that the extraordinary increase in the amount of traffic handled during the past year has not been uniformly distributed. In a large measure it has fallen upon the railroads in the eastern section of the country, all of whose facilities have been strained far beyond the extent indicated by general averages.

The motive power shortage which has been so acute during the past winter has been due, however, much more to causes decreasing the capacity of the locomotives actually available, than directly to a shortage of locomotives. The past winter was the second through which the railroads have been operating under extraordinary traffic conditions. While a few roads were able to enter the winter with their power in better shape than it was just prior to the preceding winter, in general there was a lack of a normal reserve in the average condition of the locomotives of the country. The effect of the exceedingly severe weather conditions would have been dire even with all the power in the best possible condition.

Effect of Severe Winter

In considering this matter, it should not be overlooked that winter conditions always affect the capacity and efficiency of motive power in two ways: First, by decreasing the tonnage rating during storms and cold snaps; second, by materially increasing the number of engine failures. Without considering the effect of snow, which may decrease the hauling capacity anywhere from zero to 100 per cent, the low temperatures prevailing in the eastern section of the country, and even in some sections of the south usually but slightly affected by winter conditions, required a reduction of 25 per cent and upwards in maximum train loading. Ordinarily, the aggregate loss of capacity to the railroads in the greater part of the country is not large from this cause because the heavily reduced ratings are in effect for comparatively short periods and but a few times in the course of the winter. During the past winter, however, extremely low temperatures prevailed over practically all of the eastern section of the country, where traffic conditions were densest, for the greater part of two months and the snowstorms rapidly succeeding each other necessitated even greater reductions in trainloading. It is therefore evident that even though operation had otherwise been normal, the effect of the winter must have been an abnormally large loss in locomotive capacity.

Anyone who has followed the course of locomotive failures has observed the marked increase in their number during the winter months, even under average winter conditions. That engine failures should increase far beyond the normal winter average during the past winter was inevitable, even with all other factors affecting the condition of motive power remaining normal. But other factors were not normal. The capacity of locomotive terminals was decreased; for several months there has been an excessive turnover of firemen, resulting in a large number of inexperienced men being in service during the past winter, and the railroads have suffered their full share of the difficulties incident to any attempt to make steam from the kind of coal mined last winter.

While there may have been but little, if any, actual decrease in the number of men employed in the maintenance of locomotives during the winter, there has been a sufficient loss of experienced mechanics to materially slow up the operation of locomotive terminals. Added to this was the disorganizing effect of two months of continuous winter weather conditions, unprecedented both in the severity of the cold and in the quantity and frequency of the snowfall. Not only was the efficiency of labor greatly reduced, but it was practically impossible to maintain the usual number of men in service, especially on the exceedingly important, but disagreeable outside work around engine terminals.

The delays to the movement of power at engine terminals caused by these conditions resulted in the freezing up of many locomotives and increased the amount of running repairs required. While it is not impossible to operate locomotives without freeze-ups under the most severe weather conditions, even where they must frequently be stored outdoors in the winter, such a result can only be attained at the price of eternal vigilance on the part of engine terminal forces accustomed to such weather conditions. Where such conditions are not ordinarily experienced, however, and where more or less inexperienced labor is employed, an excessive number of locomotive freeze-ups, resulting in broken cylinders, burst branch pipes, etc., is inevitable.

These conditions all resulted in decreasing the amount and condition of the power available for the use of the transportation department. All of them directly affected the mechanical department or operations under its control. There were unusual operating conditions which had either a direct influence on the effectiveness of the locomotives while in service or indirectly produced similar results by hindering the proper maintenance of the power.

For a year or more there has been an excessive turnover of firemen, as a consequence of which there are a large

number of comparatively inexperienced men in the engine service of many roads. At any time such a condition is a handicap and it was unusually so last winter. Low temperatures and snow always increase the difficulty of maintaining steam pressure and become a severe test of the skill of the most experienced firemen, and coal to the uniformly low quality available last winter does not help matters any. A slowing down of train movement, a loss of engine capacity and an increase of engine failures can only be the result of such a combination.

A regulation of the Fuel Administration requiring railroads to use coal on a pro rata basis from all mines which they served had a disturbing influence upon the quality and grades of coal which some of them were able to obtain. In one case this increased the number of mines from which the road received its coal by several hundred and resulted in a loss of control over the distribution of the several kinds of coal mined in the district.

The exceptionally high traffic density prevailing on the eastern railroads for the past year has resulted in the utilization of yard and terminal facilities practically to capacity. But little additional burden was necessary to cause congestion at these points, which immediately resulted in a general slowing up of the traffic movement. The additional burden was supplied by the weather conditions. Again, one of the effects was a loss of motive power. The congestion at terminals caused long delays to trains waiting to enter the yards. Indeed, it has not been an uncommon occurrence for crews to be caught by the 16-hour law almost within sight of the home terminal. Every hour of delay on the road means one less hour for the locomotive in the hands of the mechanical department for needed attention, as well as a probability of a considerable increase in the amount of work required to keep the locomotive in good condition. Furthermore, the long delays to locomotives caught in the storms, which followed each other in such rapid successsion, resulted in very rapid deterioration. In fact, as one railroad man expressed it, the best way to operate a railroad under such conditions is "to put the locomotives in the roundhouse and lock the doors" until the storm has subsided.

Getting Ready for Next Winter

The foregoing paragraphs indicate that there were many contributing causes other than an actual shortage of locomotives to the shortage of motive power which has been so keenly felt during the past winter, and that practically all of them had their origin in the unprecedented severity of the winter. With the smooth running of locomotive terminals and regularity of road operating conditions following the winter weather there is evident a general catching up on running repairs and a marked improvement in motive power condition so far as the present and immediate future are concerned. Probably the greatest immediate need for motive power is in yard service to facilitate the clearing of terminals of the accumulation of cars encroaching upon their working capacity.

In order that the railroads may enter next winter with an adequate reserve of power, however, it is probable that not less than 60 per cent of the locomotives of the country will require general overhauling within the next seven months. This is an unusually large program and its accomplishment will necessitate extraordinary effort and the most effective use of every available facility for locomotive repairs.

Of the greatest value in meeting this demand for repairs will be more stable labor conditions. The best information available indicates that the number of men employed in the maintenance of locomotives is larger now than it was a year ago, which is a hopeful sign for future output. This, together with a decrease in labor turnover, due to a gradual stabilizing of the demand for labor in all industries, a general realization on the part of men employed in railroad work of the importance to the country of the work they have in hand in their present positions, and the confidence that they will receive full justice which should be inspired by the Railroad Administration's handling of the whole wage problem, undoubtedly will have a very beneficial effect in increasing the general efficiency of locomotive shop operations. The working of longer hours already has had its effect in many shops and as the plan of working becomes more generally adopted a material increase in the aggregate output of the railroad shops of the country may be confidently expected.

Many railroads do not have adequate facilities for taking care of their requirements for power for general overhauling even under normal conditions, and under the extraordinary demands upon shop facilities obtaining in the present situation, they are finding it impossible to bring their power back to a condition in which there will be a normal reserve with which to face another winter. While it is doubtful if there is any railroad with what actually may be considered a surplus of shop capacity, there are a number of railroads with such relatively large shop capacity that in the present emergency they are fully justified in helping out those roads which are less fortunate. The railroads have already taken advantage of such possibilities and at the present time over 100 locomotives are being repaired in shops other than those of the owning roads. Until recently, however, this matter has been handled in a haphazard manner. It is now in the hands of the Manager of the Locomotive Section of the Railway Administration, under whom, as pointed out elsewhere in this issue, the fullest advantage will be taken of the country's aggregate shop capacity.

As was indicated at the beginning of this discussion, the acute shortage of motive power obtaining during the winter may be attributed perhaps as much to an unusual decrease in the effectiveness of the locomotives already available, brought about by conditions which could not altogether be overcome by the addition of new locomotives, as to an actual shortage in the number of locomotives. The importance of bending every effort to putting existing locomotives back into the best possible condition is therefore evident.

There are in service a large number of locomotives built before the general adoption of the superheater. Many of these locomotives are still of too great economic value, even under normal conditions, to be retired from service. The added capacity which may be obtained by the conversion of these locomotives should not be overlooked in an attempt to keep down expenditures or to expedite the turning of power through the shops. For the additional expenditure of money and labor required to make the conversion, as much additional hauling capacity could not be obtained in any other way.

There will be little difficulty in using all of the new locomotives the builders can turn out this year. The builders will probably be able to turn out between 3,500 and 4,000 locomotives for domestic use during the year 1918, a number considerably more than 1,000 in excess of the number built for home railroads last year. These locomotives, the distribution of which will more closely conform to the actual local requirements for new power than has ordinarily been possible, will add materially to next winter's reserve.

Indeed with the added relief which smoother working and better co-ordinated traffic arrangements have already offered, there is every reason to believe that the railroads will be in a far better position to meet the essential demands of the country next winter than they were last. Just what the weather will do to transportation, the country can only wait and see. It is a safe assumption, however, that it has few terrors which we have not already experienced.

Government Control of Railway Traffic Departments

Abandonment of Solicitation and Advertising Among the Changes Introduced by New Regime

GOVERNMENT CONTROL OF RAILWAYS has had, and probably will continue to have, more far-reaching effects on the traffic departments than in any other branch of the railroad organizations. The big outstanding fact brought out by the assumption of the control of the carriers by the government is the unification of the transportation system of the country for operating purposes. This, added to a condition of superabundant traffic resulting from war conditions, made the continuance of freight and passenger solicitation questionable. On the other hand, it has been the general consensus of opinion that traffic representatives who have devoted their lives to the solicitation of competitive business cannot be lightly considered. While the situation has reached the point where the director-general has ordered the discontinuance of solicitation, it is the understanding of those in close touch with the Railroad Administration that every effort will be made to take care of the soliciting forces in other railroad work.

It has been pointed out by many traffic men that the elimination of solicitation will not in any way alter the necessity for informative work on the part of the traffic departments. In other words, under any method of operation the public will demand certain information in regard to fares, rates, routes, classifications, service, etc. According to the latest information all outside traffic agencies throughout the country will be closed and the informative work done by them will be taken over by resident lines. For this purpose it will probably be necessary for the local lines to employ agents of outside offices to take care of business destined to the territory with which their work has made them familiar. In the passenger field it seems to be the intention of the Railroad Administration to centralize all city ticket offices, thereby saving the expense of maintaining separate offices in choice locations in the larger cities. Up to the present time ticket offices in both Washington, D. C., and Atlanta, Ga., have been combined.

An expected corollary of the order to discontinue solicitation was the order to stop advertising. Although the railroad administration has not specified what it means by "advertising," a literal interpretation of its order would mean the discontinuance of all efforts to increase passenger travel and freight traffic through the medium of publicity. While it is generally understood that this order will mean the end of campaigns to encourage pleasure tours to national parks, national monuments, summer and winter resorts, it is not interpreted as meaning the discontinuance of agricultural and industrial development work carried on for the purpose of creating new sources of freight traffic. It is pointed out that the agricultural work carried on by the railroads is particularly valuable at the present time to increase the food production of the country during the war. The fruitful efforts of the roads in this direction last year are pointed to with justifiable pride. One of the advantages which it is hoped will develop from the elimination of competition is further attention on the part of the railroads to the needs of all their patrons regardless of their size and importance. Under competitive conditions the railroads necessarily gave the best service to the large shippers and undoubtedly in many instances the small shippers at local points suffered.

One of the most radical changes ushered in by the new regime is the re-schedule of passenger service between the large cities of the country, with absolute disregard of former competitive conditions and with the one purpose in view of reducing passenger service to the minimum in order to save fuel and locomotives for the movement of freight traffic. While the Railroad Administration has caused the removal of a large number of trains throughout the country, and particularly in the East, the first case of the revision of the schedules of all railroads operating between two large cities was the rearrangement of service between Chicago and St. Louis, effective March 17. The new plan resulted in a reduction from 15 daily trains between the two cities to 9, more evenly distributed throughout the day. The plan also provides that tickets between these two points are interchangeable, thereby enabling passengers to use other roads if the train they intended to take is overcrowded. While the Railroad Administration has made no definite announcement to that effect, it seems to be the general opinion that passenger tickets throughout the country will be made interchangeable. The director-general's staff is now working on the re-schedule of train service between other large points in the country, and in the course of time, no doubt, passenger service will be reduced to the minimum needs of the traveling public.

There is considerable speculation as to the future of the various territorial rate committees. In view of the further elimination of competition between roads, the logic of the situation would seem to demand a further extension of the work of these bodies rather than a curtailment of their work. There is some study of the possibilities of creating superior regional rate committees to take care of the larger questions affecting the three railroad regions of the country. These committees as well as the territorial committees will undoubtedly consist of railroad traffic officers of prominence who will have more real authority than the present committees and will hold sessions whenever necessary to consider the applications and complaints of the shippers and consignees in their jurisdictions. Under the present arrangement the negative vote of one road will nullify any action under consideration by a committee. Under the new plan all questions will be determined by majority vote. Under the new plans, if worked out, it is probable that joint tariffs will be issued in much greater numbers than in the past, and this will call for increased activity on the part of the committees. This view seems to be reaffirmed by the plans the Railroad Adiministration is understood to be preparing for the routing of freight. These plans, it is believed, include the working out of routes in the main avenues of traffic without regard to any principles except such physical facts as distance, grade, the condition of roadbed and rails, etc. This will mean that company lines will be ignored and the business which individual roads have spent years to build up will go over the roads which can handle it most economically.

All in all, the effects of government control on the personnel and methods of the traffic departments of the American railroads have been most profound, but we are still in the transition period with many problems yet unsolved. It is therefore only possible to outline what has been done up to this time and to indicate the probable developments of the future. The Railroad Administration is working out these problems carefully and deliberately with the greatest possible deference to the continued stability of traffic, relationships and the rights of railroad employees and officers who have spent their lives in competitive activity. For this work Director-General McAdoo has selected some of the foremost traffic executives of the country to assist him, and it is unlikely that he will take any steps that are ill-advised or unsound.

Corporate and Operating Organizations Separated

THE POLICY OF THE RAILROAD ADMINISTRATION, that the corporate and the operating functions of the railways are to be distinctly separated under federal control of the roads, the corporate functions to be under the control of the companies and paid for out of the compensation to be guaranteed by the government for the use of the properties, and the operating functions to be under the control of the director general and his organization and paid for out of operating revenues, was more definitely indicated than it has been heretofore by a general order and a circular issued by Director General McAdoo on March 28 and March 30. The general order provides that the president of each company shall be treated as the principal executive authority in all matters of operation and that the chairmen of boards of directors, or of committees of boards of directors, shall not exercise functions connected with the operation of the roads under federal control. The circular expresses the opinion that the government ought not to pay the salaries and expenses of officers whose services are not reasonably required for the operation of the roads.

This idea was expressed in a general way in Circular No. 10 issued on March 18, which provided that after April 1 expenses of offices, including salaries, devoted to financial affairs as distinguished from operation, might not be charged to operating expenses except as expressly authorized. This circular applied particularly to the financial offices in New York and elsewhere but it was understood as indicating the separation which was to be made between corporate and operating functions. It provided, however, that each carrier should present a statement showing the amount of such expense which it was claimed should fairly be chargeable to the government, with the reasons therefor.

General Order No. 16 and circular No. 17 are more explicit in indicating the policy to be followed although no order is made except as to chairmen of boards or of executive committees. It is stated that the entire subject is still under consideration and that the government may charge back against the corporate funds of the company any amounts charged to operating expenses after April 1 which it does not consider are properly chargeable to operation. The circular applies not only to financial officers but to traffic officers, counsel, and practically retired officers who have been continued on a salary in recognition of past services. Many of the railroad companies have already given consideration to these questions and it is understood that arrangements have already been made to transfer a considerable number of officers from the operating to the corporate accounts.

The order and the circular are as follows:

General Order No. 16

"In the organization of the various carriers, some doubt appears at times to exist as to the extent to which, if at all, the executive authority in operating matters is divided between the president of the company and the chairman of its board of directors, or of some committee thereof.

"For the purpose of simplification and definiteness it is ordered that the president of each company shall be treated by the United States Railroad Administration as the company's principal executive authority (subject to the director general), in all matters of operation under federal control and that chairmen of boards of directors, or of committees thereof, shall not exercise functions connected with the operation of the railroads under federal control."

Circular No. 17

"The director general is of opinion that the government ought not to pay the salaries and office and traveling expenses of officers whose services are not reasonably required for the operation of the railroads. It is, of course, evident that in the past the railroad companies, in establishing and maintaining their staffs of officers, have provided not only for the actual necessities of operation, but in addition have provided (a) for financial and corporate functions beyond what is necessarily connected with operation—for example, functions calling for chairmen of boards of directors and of executive committees, etc.; (b) for other activities in which the company may be lawfully engaged, but whose operation is not to be conducted by the government; (c) for operating functions which were natural when railroads were operated under the competitive system, but which are unnecessary under existing conditions—for example, traffic functions connected with the obtaining of traffic rather than with the giving of adequate and convenient information and assistance to the public; (d) for officers who have practically retired from service and whose salaries have been continued because of their past services rather than because of their need for current operation; (e) for counsel whose services have not been needed for the conduct of ordinary operating activities of the company but who to a large extent, if not entirely, have devoted themselves to matters of a corporate character; (for example, many of whom are now devoting themselves to the problems in connection with the making of the contracts with the government for the use of the railroads).

"It will be necessary for the government to make a careful study to determine the extent to which operating expenses under government control should be relieved of charges for the salaries and office and traveling expenses of officers not necessary to carry on operating functions, and this circular is to give notice that this subject is and will be under consideration, and that in clear cases the government may charge back against the company any amounts charged into operating expenses on and after April 1, 1918, for the salaries and office and traveling expenses of officers who are not required to conduct railroad operations.

"This policy will not affect the positions of any officers whom the company itself may desire to continue to pay out of its own funds, but who are not necessary to railroad operations.

"It is the purpose of the government to carry out the above policy in a reasonable and considerate way and not to disturb unnecessarily the operating forces of the railroads. In general it is anticipated that the rank and file of railroad officers are needed for the conduct of the company's business and that practically all railroad employees, as distinguished from officers, can be continued in service even though the offices in which they now work may no longer be continued. It is believed that the readjustment of operating charges above suggested will be called for almost, if not entirely, with reference to general officers of the character illustrated by clauses a to e, whose functions are not necessarily connected with operation."

GERMAN FREIGHT ROBBERIES CONTINUE.—According to an official statement in the Prussian Diet concerning robberies on the State railways during 1917, merchandise to the value of $14,250,000 had been stolen from freight trains and depots alone. The Minister of Public Works said that in 1914 only $1,175,000 worth of freight was stolen. In 1916 the amount rose to $4,450,000, and by the end of 1917 it had increased by more than 300 per cent over the preceding year. Within a certain period, which the Minister did not detail, 1,343 ordinary civilians and 2,622 railway employees, mostly "National Service" recruits were punished for theft. The authorities, says the London Daily Mail, found themselves powerless to check the carnival of robbery. They were compelled to regard it as a "war evil" which time alone would eradicate. Meantime they were forced to acknowledge that the security of freight entrusted to the State railways could not be guaranteed.

Large Expenditures Needed for Maintenance of Way

There Has Been a Marked Deficiency in the Outlay for Upkeep; Rail Renewals Are Far in Arrears

IT IS A MATTER OF COMMON KNOWLEDGE among railroad men that the present condition of railway tracks and structures in the United States is not in conformity with established standards. In other words, there is an appreciable amount of what is known as deferred maintenance. This is apparent to any seasoned traveler who has noticed the deterioration in the riding qualities of the tracks, even on some of the highest grade main lines—lines which in the past enjoyed reputations for smooth riding and perfection of upkeep. Such purely qualitative comments are of value only as indicating a general tendency, but on the other hand any attempt at a quantitative analysis of anything so intangible as a condition of maintenance is beset with serious difficulties. It is possible to make a detailed inspection of a given piece of track and prepare a reasonably exact estimate of what would be necessary to restore it to standard condition, but a similar study of the conditions throughout the country covering all classes of property, including main lines, and terminals as well, would lead nowhere.

There are, however, a few indexes which may be applied to indicate the relative condition of railway structures and roadways today as compared to what it has been in the past, and of such indications probably the most important is to be obtained by a study of the amount of money spent from year to year for maintenance of way by the railroads of the country. For this purpose, a table is given below showing the expenditures for maintenance of way with the total operating revenues for the years 1913 to 1917 inclusive, and a column showing the per cent of maintenance of way expenses to operating revenues.

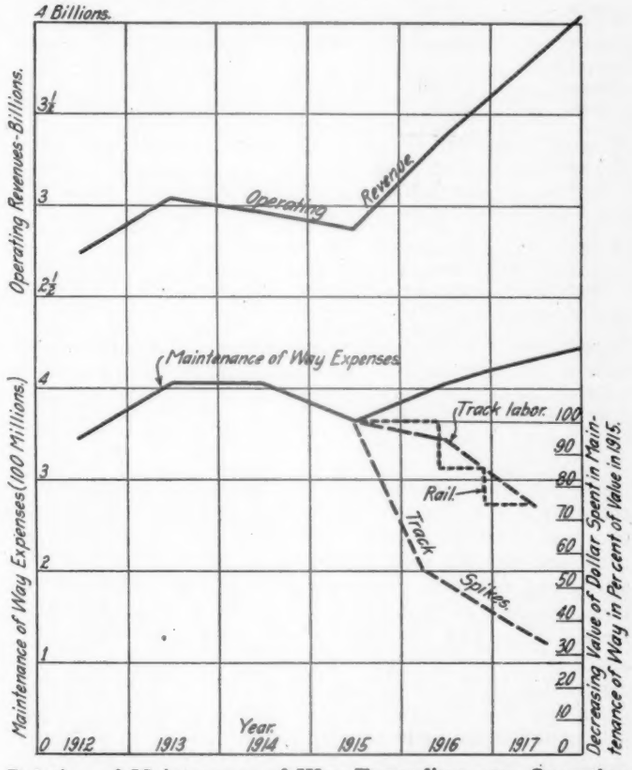
CLASS I ROADS

Year	Operating revenues	Expenditures for maintenance of way: Amount	Expenditures for maintenance of way: Per cent of operating revenues
1912	$2,744,342,277	$348,470,704	12.7
1913	3,043,324,782	405,840,494	13.3
1914	2,969,398,838	403,682,593	13.6
1915	2,871,563,047	364,004,178	12.7
1916	3,381,945,764	404,554,315	12.0
1916*	3,592,591,023	421,193,640	11.7
1917*	4,041,014,239	444,458,855	11.0

*Calendar year, all others are for the fiscal year ending June 30.

Operating revenues are given here because of the relatively simple ratio they bear to the traffic carried by the tracks. From an examination of the table it is seen that the percentage relation of the maintenance of way expenditures to operating revenues has decreased from 13.6 per cent in 1914 to 11.0 per cent in 1917. Many of the items making up maintenance of way expenditures are independent of the volume of traffic, so that it is not to be expected that expenditures for maintenance will vary in direct proportion to the amount of traffic carrried. Consequently, the decrease in relative proportion of maintenance expenditures from 13.6 per cent to 11.0 per cent, as noted above, is not in itself indicative of any deficiency in the expenditures, were it not for the unfortunate fact that the value of a dollar suffered a remarkable decrease during the period in question.

This is demonstrated in the diagram on which the gross operating revenues have been plotted in relation to the maintenance of way expenditures. Superficially this shows that the maintenance expenditures have increased and decreased relatively from year to year with the variation in the revenues, but to a somewhat less pronounced extent. However, this does not take into account the reduction in the purchasing power of the dollar expended, and to introduce this into the comparison the three dotted lines have been added which show the reduction in the purchase value of the dollar in procuring three commodities typical of maintenance of way expenditures, namely: rails, track spikes and labor. These are expressed in percentages, taking the quantity that a dollar would purchase of each of these commodities in 1915 as 100 per cent. In the case of rails and track spikes the figures are based on the current quotations, while in the case



Relation of Maintenance of Way Expenditures to Operating Revenues with Indexes of the Decreasing Purchase Power of a Dollar

of labor the computations were based on the average hourly rates paid by a middle-western railroad for section laborers in typical rural communities.

These examples are given merely as indicating tendencies and it is not to be expected that these decreasing percentages may be applied directly to the expenditure for maintenance of way to determine the relative amount of effective work done in 1917 as compared to 1914. Nevertheless they give some indication of the decrease in the effectiveness of the expenditures made.

Rail Renewals

As rails form the all-important part of the track structure and as their purchase constitutes one of the large items of expense in maintenance of way, a study of rail purchases furnishes another insight into general maintenance conditions. However, a comparison of the rail renewals in any two years does not necessarily furnish a conclusive indication of the relative degree to which the tracks are being restored to standard condition, since a certain part of the tonnage has been purchased each year to be used in or as

an indirect result of newly constructed lines. Neither is it entirely safe to compare rail renewals from year to year with the traffic (operating revenues) or mileage because the increase in wheel loads, the use of heavier rail sections, and the change from Bessemer to open hearth rails, have without doubt produced some material modification in the relation of traffic to rail wear.

With these limitations in mind, attention is directed to the table given below which shows the tonnage of rails purchased by the railroads between 1893 and 1916 inclusive, in comparison with the total mileage of all tracks and the gross earnings. Considering the tonnage of rail purchases alone, it is seen that the rails purchased in 1914, 1915 and 1916 aggregated 6,024,803 tons, which is less by 1,717,980 tons than the tonnage purchased in any three consecutive years since 1902. The average for the three years 1914, 1915 and 1916 is only 2,008,268 tons as compared with an average of 2,837,055 tons for the years 1902 to 1913 inclusive. Assuming that this average represents a fulfillment of normal requirements and allowing for the 20 per cent increase in the mileage of tracks since 1907, the mid-year of this period, it is seen that rail renewals in 1914, 1915 and 1916 were deficient by 4,000,000 tons.

Consumption of Rails, Total Mileage and Gross Earnings

Year	Tonnage of rails used	Total mileage	Gross earnings	Gross earnings per ton of rails consumed
1893	1,119,470	221,863	$1,220,751,874	1,090
1894	1,008,516	229,795	1,073,361,797	1,064
1895	1,291,983	233,275	1,075,371,462	832
1896	1,056,675	239,140	1,150,169,376	1,088
1897	1,500,086	242,013	1,122,089,773	748
1898	1,679,538	245,333	1,247,325,621	742
1899	1,997,120	250,142	1,313,610,118	658
1900	2,025,511	258,784	1,487,044,814	734
1901	2,557,588	265,352	1,588,526,037	621
1902	2,943,789	274,195	1,726,380,267	586
1903	3,057,195	283,821	1,900,846,907	621
1904	1,906,237	297,073	1,975,174,091	1,036
1905	3,098,184	306,796	2,082,482,406	672
1906	3,654,794	317,083	2,325,765,167	636
1907	3,298,500	327,975	2,589,105,578	785
1908	1,726,224	333,645	2,440,638,832	1,413
1909	2,725,847	342,351	2,473,205,301	907
1910	3,290,712	351,766	2,812,141,575	854
1911	2,405,330	362,824	2,852,854,721	1,186
1912	2,885,222	371,237	2,906,415,869	1,007
1913	3,052,635	379,508	3,208,427,649	1,051
1914	1,792,986	387,208	3,127,729,588	1,744
1915	1,891,349	391,141	2,994,055,110	1,583
1916	2,340,468	394,944	3,625,252,371	1,549

The chances are that the deficiency in rail renewals is really greater than this, as there is reason to believe that rail renewals from 1908 to 1913, during which railway finances were gradually approaching the condition to which they were depressed in 1914, were curtailed at least in a measure from what good judgment would have indicated as requisite for adequate maintenance, if the money had been available. Some indication of this tendency may be had by studying the last column in the table, which shows the number of dollars of gross earnings per ton of rails purchased. It is seen that this amount ranged between $586 and $785 in all the years from 1897 to 1907 with the exception of the single year of 1904, while between 1908 and 1913 this same quantity averaged well above $1,000 and was more than $1,500 throughout 1914, 1915 and 1916. This shows that inasfar as earnings were concerned, rails were purchased in larger proportion in earlier years, although it must be remembered that new mileage entered somewhat more largely into consideration during former years that it has more recently. However, in spite of these uncertainties the fact remains that on the most liberal basis the rail renewals at the present time are seriously in arrears without any consideration of 1917, for which statistics are not yet available.

General Conditions

Aside from any attempt at mathematical demonstration, the general deficiency in maintenance of way is manifested in various ways. With the growing scarcity and increased cost of labor, it is obvious that a large number of inexperienced and inefficient men have been employed in maintenance work, so that aside from the decreased value of a dollar in the purchase of hours of labor, there is no question but that the roads received less effective output for each hour of labor purchased. Shortage of materials and difficulty in securing delivery has also had some effect in slowing up work, although as a general rule the shortage of labor has been the most serious difficulty.

As a climax to the adverse conditions, the winter of 1917-1918 added not a little to the troubles of the men responsible for the condition of track. Going into the winter with the tracks in none too good condition to withstand low temperature conditions, the Middle West and the East experienced unusually severe winters. In some localities the severity of the storms and the prolonged low temperatures have not been equalled in a great many years, while added to all these adverse circumstances, most lines have been compelled to carry a traffic exceeding anything previously imposed. The fact that some of the lines have stood up as well as they have under the enormous traffic, in spite of the inadequate maintenance, is owing to the high standards of condition in which they had been kept previous to the present emergency. However, there is a definite limit to the time that the track may be neglected with safety and the penalty which must be paid as a result of this neglect, coupled with the burden of heavy traffic is now becoming manifest. There is only one cure for this condition—increased expenditures for maintenance of way.

Central News Photo Service.

Something New in Light Railway Cars

Can the Freight Car Situation Be Improved?

Many New Cars Will Be Built, But the Maintenance Problem Is Exceedingly Serious

THE RAILROADS OF THE UNITED STATES entered the year 1918 with the greatest number of unfilled car orders ever reported at that season. During the first months of the year the roads struggled with the worst weather conditions they had ever experienced. The movement of traffic was hindered by the severe storms and freight accumulated on the originating lines. As a result the shortage of cars is now even more acute than it was at the corresponding time last year. The excess of unfilled car orders over surplus cars on March 1 was 138,102, which is more than 8,000 greater than the shortage for the same date last year, and with the exception of three months, April, May and November, 1917, is the greatest net shortage on record. The demand for cars is not confined to any particular class of equipment but the shortage of box cars in the middle west is particularly serious as it threatens to result in the loss of large quantities of foodstuffs which are in such condition that they will spoil unless marketed at once.

For more than a year and a half the unfilled demands for cars have been in excess of the number of surplus cars. Though the need for additional facilities has been universally recognized the roads have not been able to secure the capital necessary to provide the equipment. Despite the fact that there was a shortage of cars throughout 1917, the number ordered during that year was less than for any previous year since 1908. The capacity and efficiency of the transportation system are of vital importance during the period of the war. The supply of cars has an important influence on the ability of the roads to handle the traffic that is offered to them. At present the supply of cars is not sufficient to meet the demand. What are the prospects for the future?

From present indications it seems likely that more new cars will be placed in service on the railroads of this country during the present year than they have received in any year since 1912. The Railroad Administration has announced that orders will soon be placed for 100,000 cars. The builders are now in a position to make prompt deliveries. They have comparatively few cars on order and while the material situation has caused some delay in deliveries during the past six months, the conditions at the present time are such that little difficulty should be experienced on account of inability to secure either wood or steel. Reports received from the railroads indicate that while some intend to keep the entire force of car men on repair work, the aggregate number of cars built in company shops will probably be as great in 1918 as it was in 1917. It seems reasonable to anticipate that 200,000 new freight cars can be supplied to the roads this year. This amount of new equipment will do much toward improving the situation as far as car shortage is concerned. However, unless additional tracks, motive power and terminal facilities are provided, an increase in the number of cars will do little to improve the operating conditions and in fact may make them worse.

Even though an exceptionally large number of new cars may be built the greater part of the business must be handled by the equipment now in service. For that reason the condition of the existing rolling stock is quite as important as the amount of new equipment that can be secured. The great increase in the ton miles per car during the last two years has made more than the usual amount of repairs necessary to keep the equipment in good condition. The track has deteriorated during the past year and the abnormally bad condition has had its effect in increasing the wear and tear on rolling stock, besides causing an unusual amount of damage through derailments. There has been a widespread shortage of labor in the car department and the output has been still further reduced by the extreme cold weather. One road, for instance, reported that in a single month the shopmen at one of the large repair points spent over 9,000 ten-hour days shoveling snow and cleaning switches. The result has been that car repairs have of necessity been neglected.

The equipment is far from being in good condition. The draft gear and other parts which must be kept up if the cars are to remain in service are getting most of the attention. Doors and roofs are neglected to such an extent that it is difficult to get cars fit to load with high class commodities. One of the large eastern lines reported that in 30 days it had 200 truck failures due to such minor defects as nuts working off, cotter pins falling out and brake beams dropping. Care in the application of the parts would have prevented these costly failures. The repairs to air brakes are neglected to an extent that makes it necessary to use extra precautions on heavy grade lines. Such a condition should not be allowed to exist as it creates a possibility for serious accidents. Under the car service rules now in effect cars may stay off the tracks of the owning roads for long periods. As a result work which is usually done at regular intervals by the owner is neglected by the handling line because it cannot readily do it. It is seldom that a car is completely repainted except when on the home road. A great deal of steel equipment is now badly in need of painting and unless this is attended to promptly deterioration of the equipment is sure to be rapid.

The condition of equipment is not reflected by the percentage of cars in shop, which is practically the same as last year. For some time every effort has been put forth to move the traffic. The shippers have been willing to load any car that was placed on their tracks regardless of its condition and the railroads have accepted cars which formerly would not have been allowed to pass in interchange. These tendencies cannot go on indefinitely. Unless the equipment is maintained in good condition there will be a large increase in the losses in transit and if carried too far safety of operation will be sacrificed.

The repair work of the car department does not lend itself well to the application of machinery or improved methods, therefore, the question of car repairs is largely a matter of securing the proper kind of laborers in sufficient numbers. The conditions vary widely in different sections of the country but on nearly every road there is now a marked shortage of car repairers. The wage increases on the railroads have not kept pace with the advances in other lines of work and in some places common laborers are paid practically the same rate as car repairers. In many sections the wages paid to laborers in the car department are far lower than in most industries. For instance, in one southern district the rate for laborers in the car department was 22 cents an hour while the prevailing wage scale among industries and contractors was 30 cents. The result was that the railroad secured an inferior class of labor and was often unable to maintain a full force. To what extent the increases which will be authorized by the wage commission will improve the labor situation it is impossible to state. The working conditions in many car yards are far from ideal. Better

facilities would increase the production per man and make it easier to keep up the force.

Since the government assumed control of the roads the status of the M. C. B. rules of interchange has been radically changed. As it is really the government that does all the work and pays all the bills there is really no necessity for keeping a record of repairs, except as it may affect private car lines or the railroads of Canada and Mexico. It has been suggested that the labor involved in making bills for repairs and in settling the charges might be reduced by establishing regional billing departments. Some have favored even more radical measures and advocated that the rules be suspended for the period of the war. It seems, however, that this would be a step in the wrong direction. The M. C. B. code of interchange rules performs the important function of distributing the cost of equipment maintenance on an equitable basis between the roads.

Aside from this the enforcement of the rules insures that unsafe practices will not be adopted in the construction, repair or operation of cars. Those responsible for the operation of the roads cannot afford to do away with regulations which promote safety. If no record of repairs were kept it would be a difficult matter to insure that every one lived up to the provision of the M. C. B. code. There is no question that some of the rules might well be modified to take care of the changed conditions. For instance, Rule 120, as it now stands, provides that if the labor cost of making repairs to cars, for which the owner is responsible, exceeds a certain fixed amount, varying with the type of car, authority must be secured from the owner before the car is repaired. Under the present conditions no road would attempt to repair a car which would not be worth the labor and material spent upon it, and the work would be expedited if the handling line was not required to secure authority before proceeding with the repairs.

Many cars of weak construction have been given a new lease of life by reinforcement of members which could not meet the requirements of modern service. A great deal still remains to be done along this line. The work of reinforcing cars should be kept up as it offers an opportunity to increase the serviceable equipment at a comparatively small cost. It is impracticable to attempt to reinforce cars except in the shops of the home road and unrestricted routing of cars will hamper the work. Although everything possible should be done toward strengthening cars, most roads will find this an inopportune time to attempt to carry out an ambitious program for the reinforcing of weak equipment. One large road in the middle west had planned to put steel underframes on about 1,000 cars. There was some delay in securing delivery and when the underframes were received the equipment was so scattered that very few cars of the classes that were to be reinforced could be found on the home lines. The records showed that there were 89 per cent of foreign cars on the road. As this is apt to increase rather than diminish, the betterment work will necessarily proceed but slowly.

The high percentage of foreign equipment on the lines promises to make the car repair problem increasingly difficult. The shop men are familiar with the equipment of the home road and on many classes of work their production when working on foreign cars will show a considerable decrease. The forces should be increased to bring the output up to the point where equipment with which the men are not familiar, as well as that owned by the roads on which they work, will be properly maintained. It is, of course, essential that all in the car department, as in all other departments, should realize that the roads are now a unit, and that there are no longer any foreign cars in the formerly accepted sense of the word.

Government control of the roads introduces new conditions in the car department. To meet these conditions successfully will require men who are resourceful and energetic, men who realize what the new order of things means and can act accordingly. Some are still clinging to the practices of former years and in making repairs are giving preference to cars belonging to the roads for which they work. This attitude must change. Every man in the car department must do his part to keep up the condition of all equipment regardless of ownership marks in order that every car may do its share toward producing the maximum of transportation efficiency.

Central News Photo Service.

British Infantry En Route for the Front Line

New Embargo Instructions and Car Service Bulletins

THE CAR SERVICE SECTION of the Railroad Administration has issued circular No. C. S. 1-A, a revision of circular No. C. S. 1, dated February 11, 1918, containing the following new instructions to be observed in the handling of embargoes. These instructions supplement and do not supersede those contained in General Order No. C. S. 17, dated January 15, 1918, which was issued by the Commission on Car Service.

1. Place embargo without delay against consignees who do not unload freight promptly upon arrival.

2. When other than an absolute embargo is placed:

(a) Exemptions must include as many of items in paragraph 6 as circumstances warrant.

(b) Such exemptions must be in the order listed.

(c) When necessary to place embargo varying from these provisions request, with supporting detail, must first be submitted to the Car Service Section for approval.

(d) Freight for export via ocean vessels or domestic freight for port cities and their outlying terminals shall be subject to the rules and regulations of the freight traffic committees having jurisdiction over such traffic, also subject to requirements with respect to export licenses as provided for in Car Service Section Circular No. C. S. 2 of February 15, 1918, or supplements thereto.

The committees already created are: Freight Traffic Committee, North Atlantic Ports, 141 Broadway, New York City; Southern Export Committee, Healy Building, Atlanta, Ga.

It is understood that permits for export traffic will be honored against all except general embargoes, or where specifically restricted; also that permits will not be issued for domestic traffic to port cities if such permits are in conflict with outstanding embargoes.

3. It should be understood that an embargo placed against carload freight includes less carload shipments which are ordinarily forwarded in carload lots.

4. Cars must not be loaded in violation of embargoes. When shippers disregard embargoes, agents must not issue bills of lading, and cars will be held at points of origin, subject to current demurrage charges, until released.

5. The instructions herein contained do not in any way authorize preference in car supply for freight exempted from embargoes.

6. Exempted commodities (code word in italics).

Embassy.—(a) Live stock, perishable.

Emblem.—(b) Coal, coke and charcoal; acids, alcohol, ammoniacal liquor, light oil (benzol and[1] toluol), naphthalin, petroleum and its products; empty tank cars; empty metal, glass, or jacketed oil, acid, gas or ammonia containers.

Embank.—(c) Food, domestic (not export), for human consumption, including wheat, corn, oats, rye, barley, rice, cereal products, salt, canned goods, sugar, syrup, molasses, peanuts, vegetable oils and lard substitutes; feed, domestic (not export), for animals and poultry, not including hay and straw.

Embower.—(d) Materials consigned to the United States Government or its authorized agents or officers, including: The Public Printer; the Bureau of Engraving and Printing; the Post Office Department; *the War Department (Army); the Navy Department, navy yards and naval stations; the marine corps; shipments consigned to or for account of the United States Shipping Board, Emergency Fleet Corporation; shipments to the American Red Cross; the Imperial Munitions Board of Canada.

*Note.—Shipments for the War Department, destined to points named in Section 1 of Order No. 2, issued by the Director of Inland Transportation, War Department, February 18, 1918, will be handled in accordance with the terms of that order.

Emboss.—(e) Railroad material and supplies (other than coal and coke) consigned to an officer of the purchasing road at a point on such road; materials and supplies for the maintenance and operation of Pullman cars; materials and supplies consigned to locomotive and car manufacturers for the construction and repair of locomotives and freight and passenger cars.

Embed.—(f) Printing paper and printing ink; empty ink drums.

Embolden.—(g) Acetate of lime, acetone, methyl acetone, chemical wood, ketone, carbide, carbon black, chrome, graphite, manganese, pyrites, ores, copper, lead zinc, fertilizer, fertilizer materials, including agricultural lime, pulverized limestone phosphate rock, fuller's earth, liquid chlorine, alum, sulphate of iron and similar chemicals when to be used for purification of public water supply, and when consigned to municipal authorities, medicines, drugs, surgical instruments, surgical dressings, spraying materials, including arsenic (basis for insecticide), and implements for spraying, sulphur, tanners' extract, agricultural implements and farm machinery required for preparing the soil, binder twine, canning machinery, electrodes for smelting purposes, field and garden seeds, seed grain, nursery stock, food containers, laundry soap and soap powder, mine props, mine wagons, powder, and other materials and supplies necessary in the operation of coal mines, supplies for oil refineries, scrap and waste paper and other scrap stock for paper manufacture when consigned direct to paper mills or paper manufacturers, supplies for oil and natural gas wells, tin plate for manufacture of tin cans, wood pulp.

Distribution of Cars

The car service section has also issued the following bulletins regarding the distribution of cars:

"Please cancel any conflicting instructions, and effective at once discontinue the use of A. R. T. and D. S. D. refrigerator cars for packing house products. Deliver all A. R. T. and D. S. D. cars released west of Missouri river to D. & R. G. Deliver all such cars released east of the Missouri river to the Wabash and Missouri Pacific, except cars released on Texas lines, including M. K. & T. System and St. L. S. W. System, which will be delivered to the I. & G. N.

"Wabash, Missouri Pacific, and I. & G. N. railways will accept out of route all A. R. T. and D. S. D. cars via any junction point. Cars released by roads having no direct connection with these roads will route via direct lines, who will arrange for acceptance. Prompt movement is necessary to get these cars into Texas territory for the immediate protection of vegetables. We are advising railroads direct."

"The prospects are favorable for a large vegetable and fruit crop, and an unusually heavy movement of meat and dairy products. All available refrigerator, insulated and ventilated cars will be required for this loading, and it is therefore important that the use of these cars be confined strictly to the loading of commodities which require this class of equipment. Also that all such cars available be kept in constant service.

"Any railroad having at any time a surplus will report same to the Car Service Section, in order that such surplus may be directed to territory where assistance is necessary in order to move foodstuffs which otherwise cannot be taken care of."

"Reports from potato loading territory are to the effect that there is in general a sufficient supply of refrigerator cars to meet requirements. Please cancel all restrictions against the application of railroad owned cars for packing house product loading, except Great Northern, Northern Pacific, Soo Line and Illinois Central refrigerator cars,

which should continue to go to owners. This arrangement does not change instructions that Pacific Fruit Express cars move to Union Pacific, American Refrigerator Transit and D. S. D. cars to Mo. Pac. and I. & G. N., Union Refrigerator Transit cars in banana service (series 1000 to 1999) to Illinois Central and Mobile & Ohio, and other U. R. T. cars to Wisconsin roads. Please also arrange that S. F. R. D. cars shall go to the Santa Fe; that F. R. L. cars shall go to the Frisco, Mo. Pac. or I. & G. N. for Texas; and that F. G. E. cars be returned to A. C. L. and S. A. L. for fruit and vegetable loading in Florida."

Director General McAdoo Authorized to Represent President

PRESIDENT WILSON on April 1 issued a proclamation formally vesting in Director General W. G. McAdoo authority to make agreements with the railroad companies for the compensation for the use of their property during government control and otherwise to represent the President as provided for in the railroad control law approved on March 21. The proclamation authorizes Mr. McAdoo "either personally or through such divisions, agencies, or persons as he may appoint, and in his own name or in the name of such divisions, agencies or persons, or in the name of the President, to agree with the carriers, or any of them, or with any other person in interest, upon the amount of compensation to be paid pursuant to law, and to sign, seal and deliver in his own name, or in the name of the President, or in the name of the United States, such agreements as may be necessary and expedient with the several carriers or other persons in interest respecting compensation, or any other matter concerning which it may be necessary or expedient to deal, and to make any and all contracts, agreements, or obligations necessary or expedient, and to issue any and all orders which may in any way be found necessary and expedient in connection with the federal control of systems of transportation, railroads and inland waterways, as fully in all respects as the President is authorized to do, and generally to do and perform all and singular all acts and things and to exercise all and singular the powers and duties which in and by the said Act, or any other Act in relation to the subject hereof, the President is authorized to do and perform."

Negotiations are still in progress between the counsel for the railroad companies and the legal department of the Railroad Administration regarding a standard form of contract agreement for the compensation of the companies for the use of their property. A proposed form of contract was first drawn by John Barton Payne, general counsel; Nathan Matthews, assistant to the general counsel; and C. A. Prouty, director of the division of public service and accounting of the Railroad Administration, with the co-operation of a committee including Commissioners Hall, Meyer, Clark and Anderson of the Interstate Commerce Commission. This was placed before the railway counsel and they in turn drafted another proposed form which was submitted on March 23, through a sub-committee headed by Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, and including A. H. Harris, of the New York Central; George Stuart Patterson, of the Pennsylvania; C. W. Bunn, of the Northern Pacific; S. T. Bledsoe, of the Atchison, Topeka & Santa Fe, and Burton Hanson, of the Chicago, Milwaukee & St. Paul. A joint conference between the representatives of the Railroad Administration and the Interstate Commerce Commission committee and the railroad committee was held last Thursday to discuss details of the proposed contract and further conferences will be held.

Milton H. Smith, president of the Louisville & Nashville, has denied a report that his company would not enter upon an agreement with the government but would appeal to the courts to fix its compensation. He said that a resolution authorizing an agreement upon the terms proposed by President Wilson had been prepared for presentation to the stockholders on April 3.

State Commissioner for Unqualified Support of McAdoo

AT A SPECIAL PATRIOTIC MEETING of the Pacific Railway Club at San Francisco, Cal., on February 14, the proceedings of which were briefly noted in the *Railway Age* of March 1, page 473, Edwin O. Edgerton, railroad commissioner of California, declared himself in favor of unqualified support of the United States Railroad Administration. He deplored the attitude of certain state commissioners who brought political influence to bear upon Congress in an effort to secure an amendment to the administration's railroad bill whereby the state commissions in every state might issue mandatory orders binding upon the director general as well as upon the railroads. He said that such a course would have immediately plunged the country back into the difficulties under which it was laboring when the government took over the railroads. "In such a great emergency as this," he said, "these regulatory laws do not accomplish their purpose and it would be a fatal error for Congress to inject into the law, or pass any measures that restrict the full power of the director general in running the railroads."

Mr. Edgerton was likewise opposed to giving the Interstate Commerce Commission the final voice in rates. He stated that government control would bring new problems which might require the fixing of new rates promptly and that to force upon the director general a hearing before making such changes would be fatal to effectiveness.

Explaining his own attitude as a state commissioner, he said: "If I see fit to express an opinion to the director general, I shall feel free to do so just as any railroad man should feel free to do. If he does not accept the advice I propose to line up with his decision. I propose to obey promptly any order that the director general may issue. I feel so strongly on that subject—that if the power of the state is retained, it is my judgment that it is the duty of the states to line up with the orders or suggestions of the director general. My conception is that the railroad problem is a national problem. I do not believe it is a state problem. The operations of railroads are so inter-connected, even in state movements, that they can be dealt with only as a national problem, and the whole authority should be centered in one place and under one man. . . . It would seem to me that one organization, one great system, under one control ought to be able to handle the huge job before it better than many separate organizations under many separate heads."

At the same meeting W. S. Palmer, president and general manager of the Northwestern Pacific, called upon all railroad men to get behind the director general and the government and work as they have never worked before to the end that the war may be won. He said there was no room at the present time for such labor-wasting laws as the full crew bill, and on this point said: "Why expend money uselessly to provide positions in the service when man power is needed elsewhere? As to the safety feature: I will only suggest that the annual wage of every extra brakeman employed under such law would equip at least two miles of track with automatic block signals; that the extra money paid under such regulation, since the first of such laws was enacted, would have equipped nearly every main trunk line in the United States with automatic block signals, and the additional safety gained over that secured by the employment of such men

would have been a thousandfold. Once installed, their value continued indefinitely, whereas, when the wage was paid, the service was ended."

He also stated that many branch lines in the United States should be abandoned in the interest of the conservation of cars, motive power and men. Highway motor car service, he stated, would suffice for these communities.

"Now that the stimulus of competition and the necessity for hunting traffic has been in a measure removed," he said, "the traffic people are in a position to exercise what has always been one of their chief functions. They form the intelligence department of the railroads. They come in contact with the public. They meet the shippers; they are in a position to educate them—to prove to them that transportation agencies are anxious to work with them and for them, and that they must drop the selfish motives which have underlain much of their reluctance to comply with regulations the enforcement of which would ultimately result to their own benefit. They must teach the doctrine of the greatest good to the greatest number. Shippers must show their patriotism by enabling the railroad men to double or quadruple the loaded mileage of their cars, to rapidly unload and load cars placed at their establishments to avoid concentration of their shipments in certain seasons."

Professor D. M. Folsom, chairman of the oil committee of the Federal Fuel Administration, addressed the club on the need for fuel conservation on the railroads. He pointed out that California had reached its maximum production of oil and that out of 8,000 oil wells in the state 2,000 were required to furnish fuel for railroads terminating in California.

UNCLE SAM—"Here's a SCRAP o' PAPER He Won't Destroy in a Hurry"

Government-Owned Telephones in Tokyo Ten Years Behind Demands

GOVERNMENT OWNERSHIP of telephones is working out so far from well in Japan that at the present time there are 30 per cent more people waiting to have their telephone service put in than there are subscribers. The authorities hope to catch up with the demand by 1929—in not less than 10 years. In the meantime telephone brokers have bought up such telephones as are available, and any one who really must have a telephone in a hurry can obtain one for from $375 to $500. These facts are taken from the Japan Times and were forwarded for publication in Commerce Reports by Consul General George H. Scidmore at Yokohoma. His extract follows:

The number of telephone instruments installed in Tokyo is 45,000. The number of persons who have applied for installations is now 60,000, and will continue to increase. An officer of the department of communications has stated that the authorities are of the opinion that it will be possible to satisfy everyone of these applicants within 10 years, not a very brief period. He was unable to give concrete plans of the government, since they are subject to revision in accordance with any change of conditions in the city. The government, however, is at least resolved to meet the demand within about 10 years.

In order to satisfy the demand for telephones it will be necessary to treble or quadruple the present number of new installations, which calls for great effort on the part of the authorities.

There are many reasons why the telephone system of Japan has so much trouble in meeting the demand. In providing for the expense consideration must be given to the time best suited for the flotation of loans. Thus it is impossible to obtain the capital at will, and work is postponed whenever the money market is hard. There is also the question of employees. Since the work involves the handling of delicate mechanism, experience and efficiency are necessary before the workmen can do the work satisfactorily. The shortage of hands naturally delays installation. The exchange apparatus used in Japan is imported, and being made for foreign operators, is rather too high or too wide for the Japanese telephone girls, so that its full working capacity can not be attained.

These conditions do not exist in other countries. There is no other city where there is such an accumulation of applications. Tokyo has only 2 telephones to 100 persons, whereas the city of Chicago maintains 20 to 100 population. Elsewhere there are no telephone dealers who make a profit on telephone transactions as in Japan.

The telephone is a government monopoly in Japan, and if the government transacted the business itself, these brokers would be unnecessary; but as it is they are a necessary evil. The establishment of this brokerage market has brought telephones, like company stock, on the exchange. Like the stock-market price riggers, the telephone dealers attempt various manipulations to bolster the prices.

Tokyo is not the only place where such dealers are active, and they may be seen in all the large cities of the country, especially in Osaka, where prices even higher than in Tokyo are often quoted. Today a good call number costs more than 1,000 yen ($498.50), while the minimum may be said to be about 750 to 800 yen ($374 to $399).

SHORTEN THE WAR.—The sooner the irresistible might of this great republic is organized and put into full action the sooner the war will end. Every dollar invested in government securities works to shorten the war, to save the lives of American soldiers and sailors. Buy Liberty Bonds.

General News Department

Angus D. McDonald, vice-president and comptroller, southern Pacific Company, has been temporarily detailed to Washington as acting treasurer for the Railroad Administration under immediate supervision of the director of finance and purchases.

Three thousand six hundred gardens, averaging one-half acre each in size, were cultivated on the Burlington road's right-of-way, last year; and the company has distributed posters urging employees and the public to utilize the idle land of the company for war gardens again this year.

Economy in Using Fuel Oil is recognized on the Southern Pacific, Pacific system, by a distinctive mark, on the locomotive, of each class, which makes the best showing on its division. This decoration consists of bright red paint on the circular number plate which is borne on the front of the boiler.

Medals, recognizing 25 years of acceptable service, are now worn, or at least possessed, by 3,887 employees of the Southern Railway. President Fairfax Harrison has just made the third annual distribution, giving medals to employees who have completed 25 years' service since the last preceding distribution.

The existing standard time zones have been recognized by the Interstate Commerce Commission. Under the Daylight Saving Law the commission was required to define the limits of the five zones in which should be used, respectively, the times of the 75th, 90th, 105th, 120th and 150th meridians; but there was not time, before the day on which the law went into effect, to do other than recognize the existing limits; and that has been done. The 150th meridian is the standard for all Alaska.

Herbert A. Meyer, assistant to F. K. Lane, Secretary of the Interior, who has had charge (at Washington) of affairs in connection with the construction of the government railroad in Alaska, has been commissioned as a captain in the aviation branch of the Signal Corps and assigned to active duty in the field. The duties performed by Mr. Meyer in the Interior Department will be handled by Assistant to the Secretary E. C. Bradley.

The Rock Island Lines report an excellent record for increased carloading in the year 1917 as the result of an educational campaign among shippers and railroad employees. The net increase per car in all commodities was 20.5 per cent for the year, as compared with 1916. The average load per car was 51,800 lb., compared with 43,000 lb. in 1916 and 43,000 lb. in 1915. This includes all commodities loaded on the Rock Island lines. The increase in the loading of flour was 14.6 per cent.

Holdings of Oil Laws must be reported by railroads, in accordance with a circular which has been issued by Director General W. G. McAdoo. This circular calls for information concerning lands, wells and operations in which railroads have any direct or indirect interest; the estimated quantity of crude oil that could be produced within one year from April 1, 1918; the number of wells in operation, estimated cost of additional development necessary to obtain greatest production, proportion of present production used by respondent for fuel purposes, and otherwise disposed of, and other details.

The Train Despatchers' Bulletin for March conveys the news that a rival association of train despatchers is being formed. The Train Despatchers' Association of America, of which the Bulletin is the organ, is devoted to the improvement of the service and has a constitution which forbids strikes. The rival association, spoken of as the Western Train Despatchers' Association, came to the notice of the editor of the Bulletin by means of a circular mailed from Spokane, Wash., and one of the objects of the movement is to teach despatchers to "take advantage of their industrial position and to build up and protect an impregnable organization; . . . and to deal fairly and honestly with all employers who are willing to investigate and adjust difficulties."

Charles P. Neill, manager of the Bureau of Information, Southeastern Railways, and former United States Commissioner of Labor, has been appointed chief of the Industrial Service Section of the Signal Corps and W. Jett Lauck, of Washington, D. C., editor of the Labor Gazette, and former consulting statistician of the United States Commission on Industrial Relations, has been appointed as his assistant. This completes the War Department's program of creating in each important procuring bureau an organization for the development and maintenance of satisfactory relations between employers and employees engaged in production for the Army. The work of these sections is being carried on in close co-operation with the Department of Labor and is being co-ordinated through the office of the secretary of war with the labor administration.

Car Builders Confer in Washington

Car builders, who had submitted tentative prices on standard freight cars to be ordered by the government, were called into conference Wednesday afternoon by John Skelton Williams, director of finance and purchases, to discuss the tentative figures.

"You Have Chosen a Dangerous Place to Walk"

This is the heading on a card which the New York, New Haven & Hartford, through its trackmen and crossing watchmen, gives to people who walk on the tracks. The card tells of the dangers of the tracks and points out how easily a safer way may be found. About 40,000 cards have been given out.

Inspection and Test Section

The Director General has announced the creation of the Inspection and Test Section of the Division of Transportation, with C. B. Young, mechanical engineer of the Chicago, Burlington & Quincy, as manager, with office in the Southern Railway building, Washington, D. C. The manager of this section will have charge of the test and inspection of materials and work in connection with the construction of standard locomotives and cars.

Freight Car Repair Section

The Director General has announced the creation of the Freight Car Repair Section of the Division of Transportation with J. J. Tatum, superintendent of the freight car repair department of the Baltimore & Ohio, as manager, with office in the Southern Railway building, Washington, D. C. The manager of the section will supervise the condition of and repairs to freight and passenger cars in all existing railway shops and at outside shops.

Railroads Show Deficit for January

For the first time since the Interstate Commerce Commission began requiring the filing of monthly reports of earnings in 1907, the railroads of the United States showed a deficit after the payment of operating expenses and taxes for the month of January, according to a preliminary summary covering 172 roads issued by the commission on March 28. Returns were still to be received from 24 additional roads, but those reporting, covering 215,456 miles of line, show a deficit in the place of operating income of $2,227,535, as compared with an income of $67,279,659 in 1917. This report strikingly reflects the influence of the unprecedented weather experienced in January, particularly in the eastern section. Railway operating revenues amounted to $270,231,812, as compared with $283,000,000 in January, 1917, and railway operating expenses were $257,868,006 as compared with $203,000,000 in 1917. Tax accruals were $14,551,790 as compared with $13,000,000 in 1917. The revenues per mile were $1,254, expenses per mile $1,197, net revenue per mile $57, tax accruals

per mile $67, and the deficit per mile $10. The regular sworn reports have not yet been rendered for the month of January as the printing of the forms was held in abeyance pending the enactment of the railroad law, which became effective on March 21.

Safety First on the Canadian Government Railways

J. E. Long, safety engineer of the Intercolonial Railway (including also the Prince Edward's Island) reports that during 1917 on those lines 1 passenger, 9 employees and 20 other persons were killed, and 13 passengers, 704 employees and 21 other persons were injured. There has been a steady decrease in casualties since the "safety-first" department was started in January, 1914. In 1913 the number of employees killed was 19; and taking the annual average of the last four years and comparing with what the record would have been if there had been no improvement over the record for 1913, it appears that the decrease in the number of employes killed is 50 per cent; employees injured, 19 per cent; passengers killed, 58 per cent, and passengers injured, 10 per cent. The record of trespassers killed shows, in this comparison, a decrease of only 2 per cent, while trespassers injured increased 40 per cent. This four-year record of the safety-first department covers a period of very heavy traffic—a movement greater than in any similar period in the history of the roads.

Railroad Associations Approved

The Committee on Mail Pay, of which Ralph Peters, president of the Long Island, is chairman, which has been conducting the campaign for the railroads for a more equitable system of railway mail compensation, has been authorized by the Railroad Administration to continue its work, for the balance of the year and until further order. This and other railroad associations had been given a temporary approval until April 30 pending a permanent decision, which has now been reached as to this committee. The entire question of railway mail pay is now before the Interstate Commerce Commission for decision and the committee has represented the railroads in presenting evidence to the commission.

The Bureau for the Safe Transportation of Explosives and other Dangerous Articles and the Railway Fire Protection Association have also been approved.

Railway Wage Adjustment Board

Announcement has been made of the personnel of Railway Board of Adjustment No. 1 created by the Railroad Administration to deal with controversies between the railroads and the organizations of train service employees growing out of the interpretation or application of the provisions of wage schedules or agreements. The board will consist of four representatives of the railroads and four officers of the brotherhoods, as follows: E. T. Whiter, assistant general manager of the Pennsylvania, Western Lines; J. G. Walber, secretary of the Bureau of Information of the Eastern Railroads; J. W. Higgins, executive secretary of the Association of Western Railways; C. P. Neill, manager of the Bureau of Information of the Southeastern Railroads; L. E. Sheppard, vice-president, Order of Railway Conductors; F. A. Burgess, assistant grand chief, Brotherhood of Locomotive Engineers; Albert Phillips, vice-president, Brotherhood of Locomotive Firemen and Enginemen, and W. N. Doak, vice-president, Brotherhood of Railroad Trainmen. The board will hold a meeting at Washington on Monday to organize and will proceed immediately to consider a number of pending disputes.

Government Action Against Thieves

Director General McAdoo has announced that a section for the Protection of Railroad Property and property of shippers in transit has been established in the Division of Law to enforce rigorously the federal law against theft from cars, stations, sidings, and wharves, and to take all necessary measures in co-operation with carriers to prevent loss from this cause, which in past years has been enormous. Philip J. Doherty has been appointed manager of the section. Full co-operation with this section is required from all officers and employees of the railroads, and secret service men employed by the roads are especially required to co-operate with this section, both in preventing and investigating thefts, making arrests, or prosecuting offenders, and railroad attorneys and all other officers are required to give all possible aid.

Anyone having knowledge of any such offence should report the same to the nearest railroad officer or to Mr. Doherty, in order that indictment of the guilty parties may be had under the federal law, which carries a maximum penalty of ten years' imprisonment.

Railroad officers and employees are reminded that all property being transported by the railroads is in the custody of the United States and that they owe an especial duty to guard and protect the same and to report promptly any person who tampers therewith; and the United States looks to the officers and employees to do their duty in this behalf.

Railway Regiments' Thanks for Tobacco

A number of letters have been received expressing the appreciation of the men in the railway regiments now in France for the tobacco which they have received as a result of the contributions to the Railway Regiments' Tobacco Fund, by railway supply companies in the United States. C. W. Kutz, colonel commanding the Thirteenth Engineers, writing on March 1 says:

"Ever since December 21 when I acknowledged receipt of your letter, we have been on the lookout for the shipment of tobacco which you had made. Yesterday our patience was rewarded by the receipt of three cases of smoking tobacco, each containing 12 full cartons and 4 mixed cartons of Bull Durham—1,096 packages; and 16 full cartons and 4 mixed cartons of Lucky Strike—424 cans—the total shipment being 3,288 bags of Bull Durham and 1,272 cans of Lucky Strike. The tobacco will at once be distributed among the companies of the regiment in proportion to the strength of each and then issued to the men by the company commanders from time to time. The members of this regiment feel very fortunate in having such friends as the contributors to the "Railway Regiments' Tobacco Fund," and hope by their actions to fully justify the interest of their friends in the United States. . . ."

Major John A. Laird, commanding the 12th Engineers, writing on February 27, expresses similar hearty thanks for three cases received on February 26.

V. J. Jaeger, Co. F, 13th Engineers, writing on March 4, acknowledges receipt of the first consignment of "generosity" from the Railway Supply Companies' Fund. "Words fail to express our appreciation. The smokes are the answer to our difficulties and a solace to the ills engendered in dovetailing railroading with the military end of this war game. In the language of our French comrades we simply say 'Je vous remercie.'"

Col. W. P. Wooten, of the 14th Engineers, acknowledging receipt of three cases of tobacco sends thanks to the donors and says that the men's enjoyment of the gift has been very great.

War Finance Corporation

The report of the conferees on the administration bill establishing the War Finance Corporation with a capitalization of $500,000,000 and empowered to issue $3,000,000,000 of bonds to assist in the financing of war industries, including railroads, was submitted to the Senate and passed, on April 1; and was also passed by the House on April 2. As the Senate passed the bill it provided for the issuance of $4,000,000,000 of bonds, while the House bill provided for only $2,000,000,000. The conferees agreed on $3,000,000,000 as a compromise.

The corporation is authorized to make advances for periods not exceeding five years to any bank, banker or trust company in the United States having outstanding loans to persons, firms, corporations or associations conducting an established and going business in the United States whose operations shall be necessary or contributory to the prosecution of the war, but no such advance shall exceed 75 per cent of the face value of the loan; also to banks which shall have rendered financial assistance to persons, firms or corporations. The advances are to be made upon the promissory note or notes of the banks secured by notes, bonds or other obligations which are the basis of the advance by the corporation, together with securities held as collateral for such obligations. The corporation is also authorized in exceptional cases to make advances directly to any person, firm or cor-

poration or association conducting an established and going business in the United States whose operation shall be necessary or contributary to the prosecution of the war, but only for the purpose of conducting such business and only when in the opinion of the board of directors of the corporation the person, firm, corporation or association is unable to obtain funds upon reasonable terms through banking channels or from the general public. Such advances shall be for periods not exceeding five years and in no case shall the aggregate amount exceed at any one time 12½ per cent of the authorized capital stock of the corporation, plus the aggregate amount of bonds of the corporation authorized to be outstanding at any one time. Such advance shall be secured by adequate security of such character as shall be prescribed by the board of directors, equal to (except in cases of an advance made to a railroad in the possession and control of the President for the purpose of making additions, betterments or road extensions to such railroad) at least 125 per cent of the amount advanced by the corporation.

The bill also provides for a Capital Issues Committee to investigate and determine whether it is compatible with the nation's interest that securities shall be issued by any person, firm, corporation or association in excess of $100,000. The bill provides that this shall not be construed to authorize the committee to pass upon any securities issued by any railroad corporation, the property of which may be in control of the government.

Railway Business Association Meeting at Chicago

Through the courtesy of the Railroad Administration, the forthcoming conference at Washington between the purchasing authorities and the car specialty manufacturers will be fixed for a date which will give members of the Railway Business Association ample opportunity to attend the convention of the association at Chicago on April 8.

The car specialty conference will be held not earlier than Thursday, April 11. Director of Purchases Williams, when President Post laid the situation before him, promptly wired that he would endeavor to arrange the car specialty meeting so as to enable members to attend the convention and Chairman Spencer of the Central Advisory Committee on Purchases telegraphs "You can say that meeting will not be held before Thursday of next week."

Following is the program for the Railway Business Association convention, which will be held at the Hotel La Salle:

11 a. m. (Red Room).—President's address and report of general executive committee on future activities of the association.

2 p. m. (Luncheon, ball room).—Lewis E. Pierson, chairman of the Irving National Bank of New York and chairman of the American Trade Acceptance Council, on prompter remittances for railway purchases.

2 p. m. (Red room).—Frank Rhea, of the Department of Commerce on Foreign Trade; on Opportunities in Railway Supplies, and report of committee on resolutions.

6.30 p. m. (Dinner, ball room).—Speaker to be announced.

U. S. Chamber of Commerce Meets at Chicago

The United States Chamber of Commerce will hold its sixth annual meeting at the Auditorium, Chicago, on April 10, 11 and 12. Representatives of more than 1,000 commercial organizations with a combined membership in excess of 500,000 business executives are expected to gather to discuss the further part business is to play in the war. One of the four chief subjects to be considered is Railroads and Highway Transportation. This discussion will be held on Thursday and will be under the leadership of Harry A. Wheeler, chairman of the National Chamber's Committee on Railroads. Among the speakers on this topic are Alba B. Johnson, president of the Baldwin Locomotive Works, who will speak on Motive Power; John F. Wallace, chairman of the Chicago Railway Terminal Commission, who will discuss Terminals; E. F. Carry, director of operations for the United States Shipping Board and president of the Haskell & Barker Car Company, who will speak on the subject of Car Supply, and Roy D. Chapin, chairman of the Highway Transport Committee of the Counsel of National Defense and also prominent in the automobile world, who will present the Possibilities of Highway Transportation.

Traffic News

The railroads centering in Scranton, Pa., have agreed that their freight stations shall be closed at 5 p. m., instead of 6 p. m. as heretofore. The closing time on Saturdays will be 3 o'clock.

The Railroad Administration and members of Congress have been receiving numerous letters of protest from chambers of commerce and other representatives of shippers protesting against the proposal in Trunk line, Central Freight Association and Western Trunk Line territories, to impose charges ranging from $3.50 to $8.50 per day for trap-car service.

Representatives of southwestern lines serving oil-producing territory, representatives of oil interests and of the U. S. Fuel Administration held a conference at Chicago on April 2 to work out schedules for train-lot movements of fuel oil, gasoline and naphtha oil for naval and military use. The present demands on oil cars are in excess of the supply and the object of the meeting was to work out schedules which will conserve cars to the greatest possible extent.

Hearings before the House Committee on Interstate Commerce on the bill to make the fourth section of the interstate commerce law an absolute prohibition against charging higher rates for a longer haul than for the shorter haul over the same line in the same direction, were continued last week. H. C. Barlow, chairman of the executive committee and other representatives of the National Industrial Traffic League, testified in opposition to the proposed amendment.

United States Fuel Administrator Garfield has issued the formal orders instituting the zone system of distribution for bituminous coal. Twelve general orders, imposing upon the movement of coal the limitations arranged by the fuel administrator and the director general of railroads were issued. Each order covers a single consuming zone. The orders of the fuel administrator are supported by embargoes imposed by the director general of railroads on all coal movement except in accordance with the zone system plan.

R. G. Fagan, acting assistant superintendent of transportation of the Southern Pacific, reports that in 1917 his office had to deal with inquiries concerning more than 2,000 shipments of freight which went astray or were delayed because the marks on the goods were imperfect or had been lost. At the expense of much time and labor about 1,000 of these consignments were identified and delivered to their owners. There were 942 consignees who did not get their freight at all because the packages could not be identified.

The Food Administration has issued a circular urging shippers of eggs to load refrigerator cars to the maximum. The carload minimum is placed at 24,000 lbs. The Food Administration believes that this may be generally attained without increased breakage or without using a more expensive package. The Food Administration also calls attention to the fact that heavy production of perishables will create a strong demand for refrigerator cars, this year, denying that they will be so readily available as to allow extravagant use by any trades.

The round-trip excursion rate from Philadelphia to Atlantic City and other seashore resorts, used by many thousands of people in warm weather, has been advanced from $1.00 to $1.25, both by the Pennsylvania and the Philadelphia & Reading lines. It is said that the new rate includes the war tax of 8 per cent; which means that the railroad fare is $1.16 and the tax 9 cents. It is expected that these tickets will be sold only on Sundays. Low-fare Sunday excursion trains have been suspended since January 6 as a part of the conservation of railroad men and locomotives for the movement of freight; but trains were run on Palm Sunday and on Easter.

At the annual meeting of the Traffic Club of Chicago on March 26, the following officers and directors were elected: President, Robert C. Ross, traffic manager, Joseph T. Ryerson & Son; first vice-president, E R.. Newman, assistant general freight agent of the Wabash; second vice-president,

Thomas J. Dixon, general manager, Arthur Dixon Transfer Company; third vice-president, E. A. Stedman, vice-president, Wells, Fargo & Co.; secretary, C. B. Signer, agent, Delaware, Lackawanna & Western; treasurer, Willard E. Brown, western passenger agent, Florida East Coast; directors for two years: Chas. B. Hopper, general freight agent, Goodrich Transit Company; Murray N. Billings, assistant traffic manager, Illinois Steel Company; E. L. Dalton, traffic manager, Montgomery Ward & Co.; Albert G. Francis, railroad agent, Chicago Telephone Company.

Coal Production

The production of bituminous coal increased slightly during the week ended March 23, according to the bulletin of the United States Geological Survey. The total production, including lignite and coal made into coke, is estimated at 10,972,000 net tons. The average production per working day is estimated at 1,828,000 net tons, as compared with 1,729,000 during March, 1917. Bituminous coal shipments on 123 roads were 191,525 carloads. Anthracite shipments increased from 42,265 to 42,487 cars. The percentage of full time output lost on account of car shortage during the week ended March 16 was 22.9 per cent, as compared with 33.2 per cent lost from all causes.

Proposed Standard Fruit Crates

Eight standard crates for fruits and vegetables are described in a circular which has been issued by the Fruit & Vegetable Transportation Association of the South and East; and growers and shippers of fruits and vegetables are asked to see that their goods are put up in good shape to stand transportation. These proposed containers are described in great detail, so that any competent workman can make one of them exactly to standard. They are a lettuce crate, a lettuce crate, cleated; pineapple crate, cabbage "barrel" crate (Norfolk), cabbage "barrel" crate (Florida, and asparagus crate; standard bushel crate and standard bushel crate, cleated.

The Fruit & Vegetable Transportation Association of the South and East, embraces in its membership all of the principal railroads carrying perishable freight from Florida and other southern states to northern cities, and also the Old Dominion Steamship Company. The chairman is H. C. Bixler, Pennsylvania Railroad, Broad street station, Philadelphia. In the circular he calls upon all interested to use sound containers, to select and pack their products with care and to mark each shipment plainly. The proposed standards have been decided upon in conference with all interests, including crate manufacturers and the United States Department of Agriculture.

No Sitting Up Nights to Fret

One thousand tons is the estimated daily weight of merchandise now being carried between New York and Philadelphia, 90 miles, by automobile trucks. Two new concerns have lately entered this field and it is said that about 150 large trucks are already in service. The rates are said to be about the same as those charged by the regular express companies, while in promptness and regularity the automobiles claim to be superior.

One concern, in a letter addressed to merchants, credits itself with the following merits:

"The most dependable and reliable trucking service between New York and Philadelphia. High-powered 5-ton Pierce-Arrow motor trucks, equipped with the latest windlasses.

"Trucks leave every day. You do not have to sit up nights fretting about merchandise being side-tracked in some freight yard.

"Our carefully trained drivers look after your interests, rather than our own convenience. By entrusting the delivery of your goods to us, regardless of size, shape or weight, you can do so with perfect confidence; and besides, you do not have to crate them, if you ship through us. Special monthly rate to manufacturers.

"Phone us, and our representative will call with valuable suggestions, and quote prices. Freight received before 5 p. m. will be delivered the following day (except in cases beyond our control)."

Further Curtailment of Advertising

The three regional directors of the Railroad Administration, A. H. Smith, R. H. Aishton and C. H. Markham, have each issued a circular directing the discontinuance of traffic solicitation. General orders directing the discontinuance of solicitation had been issued earlier in the year, but the following order was issued to avoid misunderstanding and to outline the policy more definitely:

"It is directed that immediately on receipt of this notice:

First: The solicitation of traffic, both freight and passenger, be eliminated.

Second: That men employed exclusively in solicitation be transferred, where needed, to other departments.

Third: It is suggested that the men employed exclusively in solicitation can be used to good advantage in the operating department in extending supervision to accelerate unloading of cars and movement of freight traffic."

Western Regional Director Aishton has also issued the following order to all lines within his jurisdiction:

"1. Discontinue the custom of exploiting train service, pleasure or health resorts and the like until further notice.

2. Discontinue all forms of advertising such as pictures, calendars, wall maps, etc.

3. Confine newspaper and other advertising to giving of necessary information to the public.

4. Standardize all time-table folders and limit their distribution, to avoid waste.

5. Folders must be purely informative and contain no advertising of luxurious trains, claims of superior service or extraneous matter of any description."

Transportation of Food Stuffs

Since early in February the Railroad Administration has been making constant efforts to expedite the transportation of grain, livestock, and other food stuffs at the request of the Food Administration, and according to daily and weekly reports compiled in the office of the Division of Transportation, has shown some very large increases in the movement of these commodities, as compared with the corresponding period of the preceding year. Daily reports are received of the grain receipts at eleven primary markets in the western district—Chicago, Cincinnati, Detroit, Duluth, Indianapolis, Kansas City, Milwaukee, Minneapolis, Omaha, Peoria and St. Louis—of the grain in elevators at the primary markets, and of the grain loading by cars; and these are tabulated weekly and kept in comparative form for reference. From February 11 to March 23, 73,760,000 bushels of grain were received at the primary markets, as compared with 32,512,000 in the corresponding period of 1917, an increase of over 41,000,000 bushels. Special efforts were made to get the grain into the elevators for drying, as approximately 60 per cent of the crop was soft. The receipts of oats during the same period ranged from over 6 million to over 8 million bushels weekly, a total of 42,771,000, which was an increase of about 15,000 bushels; but the wheat receipts were only 8,821,000, a decrease of 18,242,000 bushels, the movement of wheat to market being slack at that time. The total grain receipts were 124,352,000 bushels, an increase of 37,767,000.

The report of grain in elevators at primary markets shows an increase in grain from 3,584,000 bushels on February 2 to 12,333,000 on March 23. These figures correspond approximately with the usual weekly receipts, showing that the grain had been moved out of the elevators for consumption and export. The oats in elevators had increased from 10,853,000 bushels to 14,130,000, showing that out of total receipts of 42,000,000 bushels only 4,000,000 had remained in the elevators. The wheat in elevators on March 23 amounted to 3,621,000 bushels as against 5,425,000 bushels on February 2, and the total grain in elevators was 30,084,000 bushels, as compared with 19,964,000 on February 2.

The total grain loaded in the period March 11 to March 23 in eastern, southern and western districts had averaged over 4,000 cars a day. From February 10 until March 23 a total of 37,456 cars of livestock, dressed beef and perishables were forwarded east from Chicago and from February 12 until March 23 a total of 10,806 cars were moved in special food trains from Chicago and East St. Louis to New York, Philadelphia and Boston for export.

Supply Trade News

United States Government Locomotives

Specifications have been prepared by the Railroad Administration for 8 types of locomotives:

Light and heavy mountain types.
Light and heavy Mikado types.
Light and heavy Pacific types.
Six-wheel and eight-wheel switching locomotives.

The director-general will determine the number of each type which will be ordered for use in the different regions. The proposed standard specifications for locomotives although still subject to slight revisions, were given to locomotive builders some time ago and they have submitted their prices, which are being carefully scrutinized and checked. If the costs for any item seem high, the reason for it will be ascertained, and if necessary the government will arrange to purchase certain materials for builders where it can do so more cheaply. A meeting was held at Washington on Monday with the manufacturers of locomotive specialties to consider informally the specialties to be used on the standard locomotives to be ordered. A similar meeting will be held shortly with the manufacturers of car specialties. Detailed prices on the cars have been received and will be checked before a decision is reached as to the number of each type to be ordered.

Henry A. Hawes, representative in the Chicago office of the P. & M. Company, has resigned to join the Railway Engineering Regiment, at Camp Grant, Ill.

The H. W. Johns-Manville Company advises that its office in Memphis, Tenn., has been removed to 804-5 Exchange building, at Madison avenue and Second street.

The Asbestos Protected Metal Company, Pittsburgh, announces the appointment of Herbert Longstaff as manager of its St. Louis office, located in the Boatman's Bank building.

Colonel Henry P. Bope has resigned his position as vice-president and general manager of sales of the Carnegie Steel Company, effective April 1, 1918. He has been succeeded by **William G. Clyde.**

Laura G. Edwards, for ten years connected with the advertising department of the National Tube Company, has resigned, effective April 1, to enter the service of the publicity department of the A. M. Byers Company.

R. W. Hunt & Co., Limited, Montreal, have been commissioned by the Canadian Government to inspect 100,000 tons of rails which that government has ordered from the Dominion Iron & Steel Company for distribution among the four principal roads of Canada. This commission includes the special inspection which necessitates the sending of a corps of inspectors to the mill at Sidney, N. S.

The Pittsburgh Testing Laboratory has turned over its building and equipment at Seventh and Bedford avenues, Pittsburgh, to the United States Government for the duration of the war. From April 1 until about June 15 its offices will be in the B. F. Jones Law building, Fourth avenue and Ross street. After June 15 its offices and laboratories will be located at 612-620 Grant street, the buildings being remodelled and fully equipped for the company's special needs.

Fred H. Jones has been appointed resident manager for the General Railway Signal Company, in charge of eastern territory, with office at 30 Church St., New York, effective May 1. Mr. Jones has been connected with the General Railway Signal Company since the time of its organization in 1904. During this period, he has held a number of the important positions with the company including assistant resident manager of the Chicago office and resident manager of the San Francisco office.

The Chicago Railway Signal & Supply Company, Chicago, has increased the size of its plant at Carpentersville, Ill., by taking over a number of shop buildings formerly used for other purposes. Where space has been available in these various buildings, modern machines have recently been installed. A power house and hydro-electric station generating power from the Fox river has recently been placed in service. These increased manufacturing facilities have been added with the view of producing a more extensive line of signal apparatus and supplies.

W. S. Bartholomew, president of the Locomotive Stoker Company, has been elected vice-president of the Westinghouse Air Brake Company in direct charge of the activities of the stoker company and to attend to such other duties as may be assigned to him. Mr. Bartholomew received his education in the public schools of Chicago and in the North-Western University. He entered business life with Geo. B. Carpenter & Co., leaving that company to enter the service of Adams & Westlake, in course of time becoming eastern manager. In 1903 he entered the service of the Westinghouse Air Brake Company as New England representative at Boston, Mass. He remained here until 1905 when he was made western manager of the same company at Chicago, Ill. He was transferred in 1913 to the Locomotive Stoker Company, being elected president, and ever since has actively directed the development of the Street stoker and its distribution to the railroads throughout the country. He still retains his office as president of the Locomotive Stoker Company.

W. S. Bartholomew

H. D. Savage has been elected vice-president of the Locomotive Pulverized Fuel Company. He will also continue as vice-president of the American Arch Company. Mr. Savage was born at Memphis, Tenn. He was educated in the public schools at Ashland, Ky., and at the Kenyon Military Academy. He started his business life with the Ashland Fire Brick Company in the manufacturing department serving in various capacities. Later he was appointed manager of sales and during his ten years in this position he made great strides towards putting the manufacture of high grade refractories on a scientific basis. He was largely instrumental in making Ashland the most modern brick plant in the country at that time introducing may features making for uniformity of product and increased output. Together with the late E. S. Hitchens he organized the Refractory Manufacturers' Association of which he was elected the first president. This association includes in its membership practically all the manufacturers and users of refractory materials. Mr. Savage's work as sales manager gave him opportunity to thoroughly study the application of refractories to the metallurgical field and he enjoys a wide acquaintance in the metallurgical industry of this country. In 1914 he was elected vice-president of the American Arch Company in charge of manufacturing. In this position he organized the manufacturing department of this company so that close supervision by trained

H. D. Savage

inspection is given the fire brick at the Arch company's plants. This resulted in higher grade brick and greater service life. In 1917 in addition to his duties as vice-president of the American Arch Company he was appointed manager of sales of the Locomotive Pulverized Fuel Company.

The firm of **Waddell & Son,** which has offices in Kansas City and New York, has lately become incorporated. The new firm of Waddell & Son, Inc., includes besides **Dr. Waddell** and **N. Everett Waddell,** their former assistant engineers, **F. H. Frankland, Shortridge Hardesty,** and **L. C. Lashmet.** These five constitute the board of directors, the officers being **J. A. L. Waddell,** president; **N. Everett Waddell,** vice-president, and **L. C. Lashmet,** secretary and treasurer. Mr. Frankland is managing engineer; Mr. Hardesty, designing engineer, and Mr. Lashmet, office engineer.

On account of the growth of the Interstate Iron & Steel Company of Chicago, it has been found necessary to enlarge its offices. Because space was not available in the First National Bank building, the company has leased the east half of the 14th floor of the Monroe building, 104 South Michigan avenue, Chicago. The sales department at the Grand Crossing plant, which was recently made a part of the Interstate Iron & Steel Company, will be combined with the general sales offices and will also be moved to the Monroe building. It is expected that the change will be completed by April 6.

W. O. Duntley, president of the Chicago Pneumatic Tool Company, Chicago, resigned, effective April 1. According to a statement issued by the company, Mr. Duntley tendered his resignation in order to secure more time to look after his private business and also to take a long needed rest after 22 years in active service with the corporation. He will retain his interest in the company and will also remain a director and a member of the executive committee, and will continue to assist in an advisory capacity. No successor to Mr. Duntley has been elected, but J. G. Osgood, first vice-president will act as president.

George W. Wildin has resigned as general manager of the New York, New Haven & Hartford Railroad to enter the employ of the Westinghouse Air Brake Company as general manager of the Locomotive Stoker Company, with headquarters at Pittsburgh, Penn. He brings to his new position extensive railroad experience and a well rounded out mechanical and managerial career. Born at Decatur, Illinois, February 28, 1870, he studied at the city schools and was graduated from the Kansas State Agricultural College in June, 1892, with the degree of Bachelor of Science. He entered railway service shortly afterwards as mechanical draftsman in the Topeka shops of the Atchison, Topeka & Santa Fe. He subsequently became a machinist and a locomotive fireman on the Santa Fe and later an engineman on the Mexican Central. Leaving railway service he was for a time superintendent of the Aermotor Company, of Chicago. He soon returned to railway service however, as an engineman on the Chicago & Alton and then went to the Plant System, now a part of the Atlantic Coast Line, where he served successively as a mechinist, locomotive and car inspector and as mechanical engineer. From April 1, 1901 to March 1, 1904 he was mechanical engineer for the Central Railroad of New Jersey. On March 1, 1904, he left that company to become assistant mechanical superintendent of the Erie, being promoted on April 1 of the same year to mechanical superintendent at Meadville. From January to July, 1907 he served as assistant superintendent of motive power of the Lehigh Valley, and then left that road to accept the position as mechanical superintendent of the New Haven. In May, 1917 he was promoted to general mechanical superintendent, and in September of the same year was again promoted to the position of general manager. Mr. Wildin was president of the American Railway Master Mechanics' Association in 1910.

G. W. Wildin

Price Fixing by War Industries Board Approved

The President has approved the recommendation of the price-fixing committee of the War Industries Board that the maximum prices heretofore fixed by the President upon the recommendation of the board upon ore, coke, steel and steel products, subject to revision on April 1, 1918, be continued in effect until July 1, 1918; from April 1 to July 1, however, the maximum price of basic pig iron be reduced from $33 to $32 per gross ton, and that the maximum price of scrap steel be reduced from $30 to $29 per gross ton. No new contracts calling for delivery of any of said commodities or articles on or after July 1, 1918, are to specify a price unless coupled with a clause making the price subject to a revision by any authorized United States government agency, so that all deliveries after that date shall be within the maximum price then in force, although ordered or contracted for in the meantime.

It is expected that all manufacturers and producers will observe the maximum prices now fixed.

Dr. Snowden Returns from Australia

Dr. Albert A. Snowden, an exporter with offices at 149 Broadway, New York, has just returned from a business trip to Australia where he established a branch of his railway supply business in charge, as manager, of Hon. H. C. Hoyle, formerly minister of railways for New South Wales. Mr. Hoyle will be remembered as the special commissioner on railways who represented the Australian Government in this country last autumn when he addressed the Railway Business Association and other commercial bodies. Dr. Snowden is desirous of securing agencies for Australia and New Zealand for railway supplies and materials. He represents the Simmons-Boardman publications there.

Dr. Snowden reports that Australia at the present time is very prosperous due to the enormous production of primary products such as wool, wheat, meat, etc. While there has been a lack of sufficient ships to carry the surplus of these goods to foreign markets the British Government takes the entire wheat and wool production paying for it in advance and this brings plenty of money into circulation. Australia's mining interests have also benefited greatly by the war time prices.

Shipments to Australia are being made though not without difficulties. The recent allotment to the Australian trade of a large number of sailing vessels and other slow moving craft which have been taken from the eastern Atlantic to bring wheat from Australia to the United States affords the opportunity of further shipments from the States.

The Australian railways are in very fair condition, says Dr. Snowden, but as everywhere else in the world, there has been considerable depreciation of roadbed, and equipment, because the local manufacturer cannot begin to meet the requirements. Reports by Mr. Hoyle and Mr. Henderson, chief engineer of the Commonwealth Railways, and of other Australian railway experts who have visited the United States have aroused great interest in American methods and goods, so that with the shortage of materials and the liking for American materials the outlook for export trade in American railway supplies is very encouraging.

Trade Publications

Motor Cars.—Mudge & Co., Chicago, have issued an attractive 28-page booklet illustrating and describing the different types of motor cars made by this company. The booklet contains copies of advertisements which have appeared in technical papers recently, pointing out the advantages of this make of cars, and the names of a number of railroads using Mudge cars.

Railway Officers

Executive, Financial, Legal and Accounting

William Morris Imbrie, Jr., has been elected treasurer of the Savannah & Atlanta, with office at Savannah, Ga., vice **Thomas Goodbody.**

S. T. Bledsoe, assistant general solicitor of the Atchison, Topeka & Santa Fe, has been appointed general counsel with office at Chicago, succeeding **Walker D. Hines.**

O. D. Dalton has been elected first vice-president of the Valdosta, Moultrie & Western, and **S. W. Jones** has been elected treasurer; both with headquarters at Valdosta, Ga.

L. R. Deevers, acting auditor of the Wheeling & Lake Erie, with headquarters at Cleveland, Ohio, was appointed auditor, with same headquarters, succeeding **C. H. Holmes,** resigned, effective April 1.

Operating

A. B. Woodward was appointed chief despatcher of the Salt Lake division of the Denver & Rio Grande, with headquarters at Salt Lake City, Utah, succeeding **C. E. Leverich,** promoted, effective March 14.

L. E. Jones, secretary and treasurer of the Valdosta Moultrie & Western, with office at Valdosta, Ga., has been appointed general manager, with headquarters at Valdosta, succeeding **W. M. Legg.**

A. B. Scates, trainmaster of the Louisville & Nashville, with office at Paris, Tenn., has been appointed superintendent of the Memphis division, with headquarters at Memphis, vice **F. N. Fisher,** resigned.

L. A. David, assistant superintendent of the Missouri Pacific, with office at Atchison, Kan., has been appointed acting superintendent of the Southern Kansas division, with headquarters at Coffeyville, Kan.

W. L. Robinson, supervisor of fuel consumption, Baltimore & Ohio, has resigned to accept a position in the operating department of the E. I. du Pont de Nemours Company, Wilmington, Del. Mr. Robinson is one of the best-informed men in railway fuel matters and is at the present time vice-president of the International Railway Fuel Association and the Smoke Prevention Association.

E. Flynn, division superintendent of the Chicago, Burlington & Quincy, at Chicago, has been promoted to general superintendent of the Nebraska district, with headquarters at Lincoln, Nebr., succeeding **A. G. Smart,** who was transferred to the Wyoming District, with headquarters at Alliance, Nebr., succeeding **E. E. Young,** who was appointed superintendent of the McCook division, with headquarters at McCook, Nebr., in place of **H. W. Maxwell,** who has been appointed superintendent of terminals at Kansas City, Mo., to succeed **J. P. Falk,** who was promoted to superintendent of the Chicago division, with headquarters at Chicago, succeeding Mr. Flynn. **N. C. Allen,** superintendent of the Casper division, with headquarters at Casper, Wyo., was transferred to the Omaha division, with headquarters at Omaha, Nebr., succeeding **J. H. Aydelott,** who takes Mr. Allen's place on the Casper division. The above changes were effective April 1.

Engineering and Rolling Stock

R. A. Winser, engineer of tests and fuel inspector of the Chicago & Alton, with headquarters at Bloomington, Ill., resigned, effective April 1.

G. O. Huckett, master mechanic of the Chicago, Burlington & Quincy, with office at Sterling, Colo., has been appointed master mechanic, with office at Alliance, Neb., vice **J. G. Dole,** resigned, and **C. O. Davenport,** road foreman, with office at Alliance, has been appointed master mechanic, with office at Sterling, vice Mr. Huckett.

W. B. Stokes has been appointed master mechanic of the Wrightsville & Tennille, with headquarters at Tennille, Ga., vice **M. G. Brown,** resigned to enter the service of the Georgia, Florida & Alabama, with headquarters at Bainbridge, Ga.

H. P. Anderson, mechanical engineer of the Missouri Kansas & Texas of Texas, was appointed superintendent of motive power, with headquarters at Denison, Tex., succeeding **F. W. Taylor,** promoted to general manager, effective March 1.

E. C. Anderson, mechanical engineer of the Colorado & Southern, with headquarters at Denver, Colo., has been appointed assistant mechanical engineer of the Chicago, Burlington & Quincy, with office at Chicago. **H. E. Hines,** draftsman in the office of the mechanical engineer, of the Chicago, Burlington & Quincy, has been appointed mechanical engineer of the Colorado & Southern, succeeding Mr. Anderson. **G. G. Gilpin,** chief draftsman of the mechanical department of the Chicago, Burlington & Quincy, has resigned to accept service with another company.

Purchasing

W. F. Lamb has been appointed division storekeeper of the Southern Railway, with office at South Richmond, Va., vice **J. E. Angel,** promoted.

Railway Officers in Government Service

T. C. Powell, vice president of the Southern Railway at Cincinnati, has been appointed traffic representative of the War Industries Board at Washington.

Ralph Budd, executive vice-president of the Great Northern, St. Paul, Minn., has been appointed assistant to the regional director of western railroads in charge of capital expenditures, with headquarters at Chicago.

Charles Barham, general freight agent of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., has been appointed regional director under the National Food Administration, with headquarters in Atlanta, Ga.

C. S. Albert, attorney for the Great Northern in Idaho and eastern Washington, with headquarters at Spokane, Wash., has been commissioned a major and assigned to the judge advocate's staff of the army. He will leave shortly for France.

D. L. Gray, assistant general traffic manager of the Erie has been appointed traffic representative of the Railroad Administration in co-operation with the Shipping Board, succeeding **J. F. Holden,** who has been assigned to special traffic work under **Edward Chambers,** director of traffic, of the Railroad Administration.

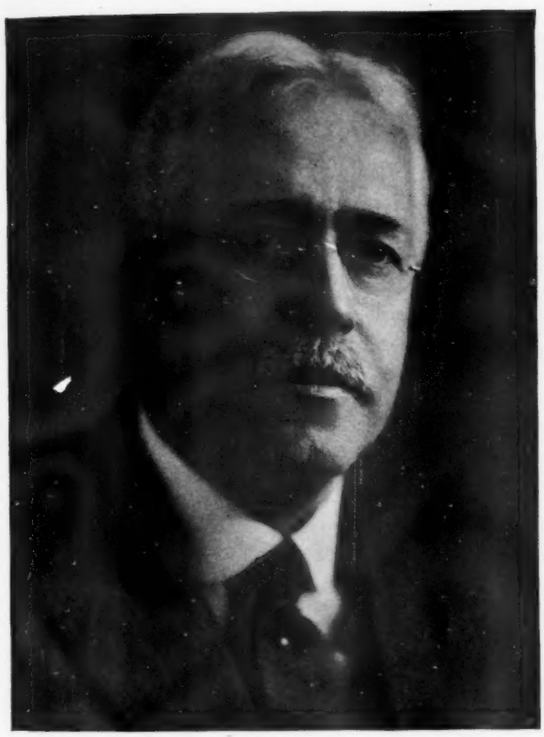
J. M. Herbert, president of the St. Louis Southwestern, has been appointed chairman of the inter-regional committee in charge of railroad operations at St. Louis and East St. Louis. He will issue such orders and instructions as will be necessary with the approval of the three regional directors of railroads, each of whom has lines under his jurisdiction entering St. Louis. **J. D. Watson,** assistant to the president of the St. Louis Southwestern has been designated by Mr. Herbert as his assistant and has relinquished his duties with the Cotton Belt in order to assume active charge of the new work.

Obituary

W. W. Cotton, counsel of the Oregon-Washington Railroad & Navigation Company, with office in Portland, Ore., died in Los Angeles, Cal., on March 13, at the age of 59.

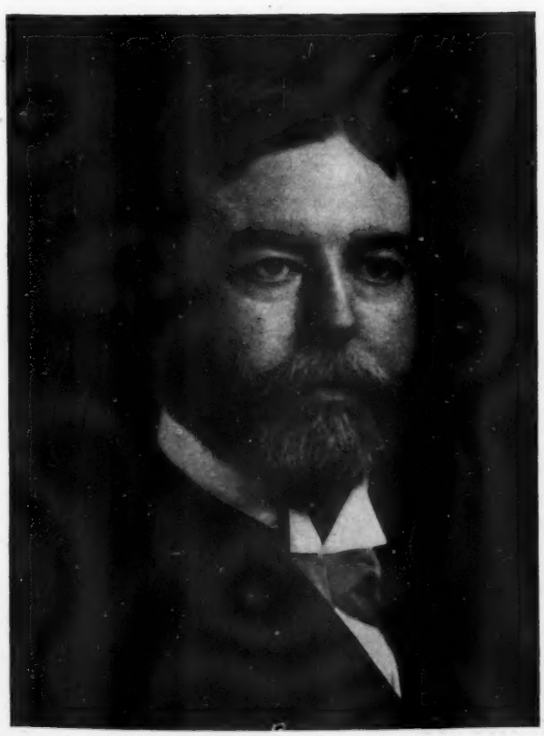
Alexander Millar, who was secertary of the Union Pacific from 1888 to July 1917, died at his home in Plainfield, N. J., on March 31. He was born in Scotland and began railway work in 1872, as a stenographer with the Union Pacific. He subsequently served consecutively as bookkeeper, chief clerk in the controller's office and as assistant secretary. In 1888 he was appointed secretary of the Union Pacific; from October, 1893, to December, 1897, he was secretary and assistant controller and then served as secretary until July, 1917, when he resigned on account of ill health.

Contributors to the Financial Section



Frank A. Vanderlip

FRANK A. VANDERLIP is the originator of the War Savings Stamp idea, and has been in charge of the sale of Thrift Stamps and War Savings Stamps for the United States Government. The sale of these stamps has brought into the United States Treasury up to date more than $75,000,000. Mr. Vanderlip's salary as director of this work has been $1 a year. He is also president of the National City Bank of New York. He is the author of Chicago Street Railways, The American Commercial Invasion of Europe, Business and Education, and Political Problems of Europe. He was a reporter on the Chicago Tribune in 1889 and at one time was financial editor. He was editor of the Economist of Chicago from 1894 to 1897. From 1897 to 1901 he was Assistant Secretary of the Treasury. He has been president of the National City Bank since January 1909.



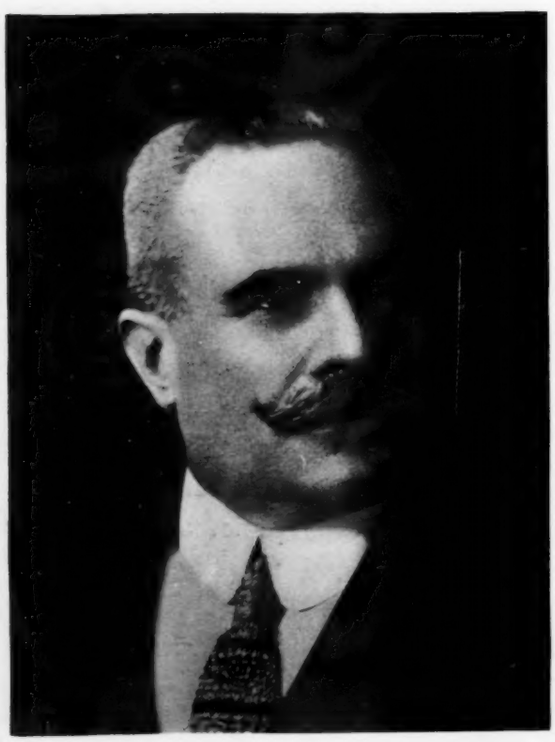
Leonor F. Loree

LEONOR F. LOREE is president of the Delaware & Hudson Company and chairman of the board of directors and chairman of the executive committee of the Kansas City Southern Railway. He was a close friend and valued adviser of the late E. H. Harriman, and a man of extraordinarily broad interests, both literary and financial. He combines both in his attitude toward other men and toward economic problems, a keen sense of humor with uncompromising fighting qualities, a combination rare to a degree. He is a graduate of Rutgers College, and began work as an assistant in an engineering corps on the Pennsylvania, and later was transitman on the topographical preliminary survey and location of the Mexican National Railway from the Rio Grande River to Saltillo, Mexico. He was president of the Baltimore & Ohio from 1901 to 1904.

Contributors to the Financial Section

Sir George Paish

SIR GEORGE PAISH is the author of The British Railway Position, The Railways of Great Britain, The Railroads of the United States, Capital Investment in Other Lands, and Savings and The Social Welfare. He was adviser to the chancellor of the exchequer and the British treasury on financing and economic questions in 1914 to 1915. In this connection, he came to America and helped in the adjustment of the crisis in the international money situation which had been brought about by the war. It is difficult to overrate the importance of his work at that time. From 1881 to 1888, he was secretary to the editor of the Statist. He was sub-editor of the Statist from 1888 to 1894, assistant editor from 1894 to 1900 and since 1900 has been joint editor. He is governor of the London School of Economics and was a member of the Departmental Committee of the Board of Trade on Railway Accounts and Statistics. He was knighted in 1912 in recognition of his work in connection with the revision of the accounts and statistics systems of British railways.



Albert Breton

ALBERT BRETON began his banking career in 1892 with the Comptoir National d'Escompte in Paris and was connected in various official capacities with their foreign branches in London, Calcutta and Bombay. He also has had business experience in Japan, China and Brazil. In 1905 he associated himself with American banking interests in New Orleans, and was up to 1916 first vice-president and a director of the Canal Bank and Trust Company. Mr. Breton has been active in the Louisiana Bankers Association, serving as its vice-president in 1908 and as president in 1909. During the three years previous to his connection with the Guaranty Trust Company, he made a special study of Central and South American banking business, and in 1913 organized the Banco Atlantida, which has branches in the principal commercial centers of Spanish Honduras, C. A. In February, 1916, Mr. Breton became associated with the Guaranty Trust Company of New York as special foreign representative, and in March of that year was made a vice-president.

Contributors to the Financial Section

ROBERTS WALKER is a lawyer, a member of the firm of White & Case of New York, a writer on dull subjects, which he treats with so much of imagination and wit as to make vividly alive the dullest of them. He graduated from Amherst in 1896 and took an LL.B. in Columbia Law School in 1899, and went to work for the law firm of Seward, Guthrie & Steele. He was made assistant to the general counsel of the Chicago, Rock Island & Pacific Railway and the St. Louis & San Francisco in 1904, and in January 1910 was made general counsel, chairman of the executive committee and president of the Rock Island Company. He became a member of White & Case in 1912. In the first rank of a profession that requires a prodigious amount of reading, Mr. Walker's acquaintance with other subjects is extraordinarily broad.

Roberts Walker

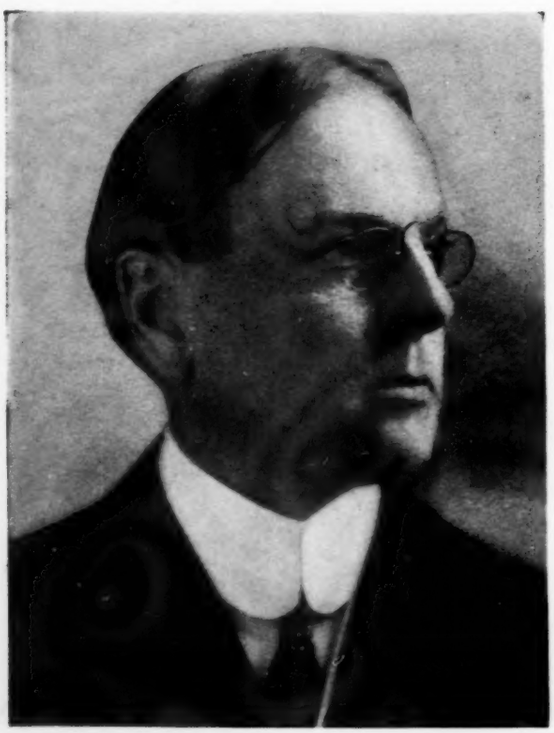
JOHN E. OLDHAM is a partner in the firm of Merrill, Oldham & Company of Boston, Mass. He has been in the investment business since his graduation from Amherst College in 1888. He has been active in connection with the Investment Bankers Association of America and at present is one of the vice-presidents. In this organization he has been for several years chairman of the Committee on Public Utilities and is at present chairman of the Committee on Railroad Securities. He is also a member of the sub-committee on capital Issues-Federal Reserve District No. 1, Boston.

John E. Oldham

Contributors to the Financial Section

John R. Hall

JOHN R. HALL is manager of the bond department of Hallgarten & Company, one of the two or three larger progressive private banking houses which have been prominent in recent reorganizations of railroad companies. He is a graduate of Hotchkiss School and of Yale University (1902). He began work as a messenger in the First National Bank, New York; later got a clerical position in the Bankers Trust Company, and then became the secretary to Robert C. Pruyn, who was president of the National Commercial Bank of Albany. He was with Crawford, Patton & Cannon of New York, before going to Hallgarten & Company. Mr. Hall is a member of the Committee on Railroad Securities of the Investment Bankers Association of America and has taken an active interest in the work of this committee, especially in the proposals which the committee made suggesting that, at the time of the sale of an issue of bonds, a committee be formed for the protection of the bond holders' interest.



O. M. W. Sprague

O. M. W. SPRAGUE is the Edmund Cogswell Converse Professor of Banking and Finance at the Harvard Graduate School of Business and Finance. He is the author of History of Crises Under the National Banking System, and Banking Reform in the United States. He served as professor of economics at the Imperial University of Tokio, Japan, from 1905 to 1908. He took the degree of A.B. at Harvard in 1894, of A.M. in 1895 and of Ph.D. in 1897. From 1900 to 1904 he was an instructor in economics at Harvard and was then made an assistant professor. A year later he was made professor at the Imperial University of Tokio. A banker having personal interests involved would in all probability find it impossible to express his views as fully, as frankly and as fearlessly as Professor Sprague does about the much discussed War Finance Corporation.

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FOREWORD

By Frank A. Vanderlip
President, National City Bank, New York

THE Railway Age, by reason of the able and thorough manner in which for many years it has covered the field of railway affairs, has made itself well-nigh indispensable to persons desiring to keep themselves well-informed upon the transportation industry. Its competent staff has dealt instructively with every phase of the railway business, including technical matters of special interest to operating officials, financial intelligence, economic problems and all of the numerous and intricate questions which have arisen out of the relations between the railways and the public.

In view of the responsible character of the publication and the ability with which its editorial policies have been directed, the announcement that it will broaden its field by adding to the regular departments which it has heretofore maintained a quarterly section devoted to general financial investment conditions, is a matter of public interest. Inasmuch as the railroads up to this time have supplied much the largest single class of securities appearing in the investment market, it is rather a natural departure for the Railway Age to extend its inquiries and comments to the fundamental conditions affecting investments.

The announcement says that the section "will be devoted to the science of the utilization of wealth as capital." There has never been a time when it was more important that the public should be impressed with the community value of capital than now. The waste of wealth going on at the present time is appalling. Enormous debts are being piled up, for the payment of which the good faith of the nations is sacredly pledged. Economic relations are being radically changed by the pressure of conditions which are themselves temporary, and there is evident danger of reaction when these conditions disappear. To meet this situation without disaster industry must be sustained after the war by large new investments in constructive work. There never is full employment for the industries except when such investments are being made. The almost complete absorption of surplus incomes by public loans during the period of the war will throw the country behind its normal development, and in order to recover this lost ground, as well as to provide immediate employment for the country's wage-earners, it will be important promptly to organize our resources to finance these new operations. That the wastes of war shall be made good, that the debts of the war shall be paid, that every man and woman wanting employment shall be able to find it, and that the efficiency and productiveness of industry shall be so increased that wages may be sustained and the costs of living at the same time reduced—these are the aims to which we must unitedly set ourselves when the war is over.

There is need for all the agencies we can have to spread correct knowledge of the part which capital plays in community progress and of the patriotic service which it can render in times of peace as well as in times of war. I am sure that the Railway Age will do good work in its new field.

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The Investment in American Railroads

What Has Happened and Is Happening to Invested Capital, and the Relations of the Railroads Thereto

By L. F. Loree
President Delaware & Hudson Company.

THE TOTAL WEALTH of the United States as of the year 1912, which was that of the latest official inventory, is stated by the bureau of census as amounting to $187,739,071,090, and may be divided as follows:

Real estate and improvements	$71,801,428,367	
Furniture, carriages, etc	8,463,216,222	
Clothing and personal ornaments	4,295,008,593	
		$84,559,653,182
Wealth subject to regulation:		
Railways	$16,148,532,502	
Street railways	4,596,563,292	
Telegraphs	223,252,516	
Telephones	1,081,433,227	
Pullman and private cars	123,362,701	
Shipping and canals	1,491,117,193	
Waterworks privately owned	290,000,000	
Light and power plants privately owned	2,098,613,122	
		26,052,874,553
Wealth not subject to regulation:		
Agricultural production—		
Land	$28,475,674,169	
Buildings	6,325,451,528	
Products	5,240,019,651	
Implements and machinery	1,368,224,548	
Irrigation enterprises	360,865,270	
Live stock, including range stock	6,238,388,985	
		48,008,624,151
Manufacturing and mining production—		
Manufacturing plants	$8,097,113,448	
Manufacturing products	14,693,866,489	
Mining plants	2,894,804,300	
Mining products	816,552,233	
		26,501,336,470
Gold and silver coin and bullion		2,616,642,734
Total		$187,739,071,090

This accumulation of $188,000,000,000 represents the total savings of the entire 300 years of settlement in this country. There is no official statement of the annual income. Estimates have been made by several authorities. From them it may be inferred that the total value of the national product and of all productive services in the year 1912 was in excess of $35,000,000,000. It is startling to reflect that the accumulations of three centuries are no more than the income of five years of our present time, and reflection gives ample warning of the dangers inherent in income and inheritance taxes that strike directly at the productive capital fund.

The residence of man upon this earth has been estimated by the scientists at from 300,000 to 1,000,000 years. Evidences of civilization, whether in Greece, Egypt or Assyria, we are told, do not date back more than 10,000 years, so recent is this precious possession of the race. And what is of even greater importance, the slender hold we have upon it, seeing that in the 800 years of the "dark ages" we almost lost it. In the view of that experience we would do well in these parlous times to test out all our methods to eliminate any found menacing.

Industries Subject to Legislative Regulation

Roughly the investments of potential capital (by which I mean wealth productively employed) divide into three principal groups, of which one-fourth (actually 25.9 per cent) is invested in industries subject to the legislative regulation of prices or rates:

(A) Those devoted to agricultural production;

(B) Those devoted to manufacturing and mining; and,

(C) Those devoted to steam transportation, traction lines, electric light and power companies, gas companies, water companies, telegraph and telephone companies, express companies, etc.—a group loosely described as public utilities and distinguished by the fact that, unlike the others, which are left substantially to the control of their management, these are regulated by an ever-increasing mass of legislation, federal and state, and as well by commissions, either federal or state, serving as deputy-legislatures or a deputy-congress.

At a time when capital invested in groups "A" and "B" is profitable to an unusual and amazing degree, capital invested in group "C" is embarrassed and too frequently threatened with destruction. A condition that involves in difficulties steam railways lying in Missouri, Kansas and Texas and, as well, in Maine, New Hampshire and Massachusetts, urban and interurban traction lines on the Pacific Coast and in New York, gas companies in Illinois and Maryland, water companies in Ohio and Pennsylvania, telephone companies in Ohio, Indiana and Illinois, and the United States Express Company, is too widespread and involves too great a variety of business experience and association to be the accident either of corporate management, character of the service, or geographical location. We must look for an explanation to the difference in circumstance; to the regulation of statute and commission. For more than a generation these public utilities, so-called, have been the subject of public attack and have been on the defensive. It is the legislature and the commission upon whom the responsibility is now clearly seen to rest and to whom we must look for a speedy solution of our problems unless we are to be involved in disaster.

The old quarrel pictured in fable between the parts of the body as to which was the most important need not be imported into this question to justify a discrimination among the three groups nor of the elements comprising them, for in the light of the world war, involving both the principles and the character of our government, the steam transportation facilities become for the moment of commanding importance. It was a maxim of the great Napoleon that "for one thought that a general gives to his enemy, he casts a thousand anxious glances to the rear," so important to the existence of an army and the conduct of war are the lines of communication. The steam railroads of this country constitute at this time its first line of communication. The army on the battle-front cannot be maintained there unless the railroads are strong and vigorous and work at their highest efficiency. If they fail the army fails, and he would be a bold man who would say that with its failure the government itself could be maintained. The responsibility is now with the legislatures and the commissions. Having grasped these utilities, they and they alone can determine whether these utilities are to be strangled or energized.

It is of the first importance to try to arrive at an exact appreciation of just what has happened and is happening, and the relation of the railroads thereto. Our railroads have been in private hands since their construction began now nearly ninety years ago, and though during late years the control over their affairs has been extreme, and the liberty of action of their officers has been tremendously curtailed, these officers are still held responsible and still feel responsible for their operation and its results. It would be a reflection upon their ability and responsibility if the railroads reflected any neglect or inadequacy of their own effort. Their vindication is that it is admitted on all sides that these instruments of transportation have steadily improved in their character and efficiency, and that whether we consider the capital involved per mile

of line open, cost of the movement per passenger or per ton of freight carried, or the declining ratio of the amount of capital involved to the unit of service rendered, their history is the envy of the civilized world.

At this moment the physical condition of these properties, the steam railroads, is better than at any time in their history. Their locomotives and cars are of the most advanced type, are well maintained and are ample for the present demands upon them. There is no occasion in my judgment for anxiety regarding either the permanent way or the equipment for the next eighteen months. The matter for anxiety, and anxiety of the gravest character, is the supply of labor, the freedom of management, the maintenance of working capital and the integrity of credit.*

The Labor Situation

The reduction of the working time of some labor from 12½ per cent to 25 per cent, the withdrawal of large numbers for service in the army, when there is suddenly additional demands to supply the wants of our own armed forces and the needs of our allies, places a great strain upon all productive enterprises and especially upon those requiring a high degree of skill and training, as do the railroads.

In something less than three generations there has been built up in the railroad service of this country a practice and a personnel that for efficiency and character stands without parallel in the world. Men entering the service are subjected at the outset to a careful physical examination; they receive systematic instruction and are held to a high state of discipline. In the main they are subject to be called upon for duty at all hours of the day and on all days of the year. They are under control not only as to the disposition of their time but as to their personal habits. They are engaged in a hazardous occupation. Having in mind the character of the force so assembled, it is of the highest importance that relatively the rate of wages paid and the conditions of employment should be such as to attract and retain in this service the pick of the industrial community.

Swift's picture of "Gulliver" reduced to immobility by the 10,000 threads by which he was fastened to the ground by the "Lilliputians" is not an exaggerated illustration of the condition to which the railroads have been reduced. Lloyd George, then Minister of Munitions of Great Britain, said to a trades union congress in December, 1915:

> "The next direction in which trade unionists can help us is by suspending during the war again all practices and customs which have the effect of preventing men from turning out as much work as their skill and strength permit. I am going to speak about that very plainly later on. What I will tell you now is that the reports we get from our own offices, the Admiralty, the War Office and the Munitions Department, show that if we had a suspension during the war of these customs which keep down the output, we could increase it in some places by 30 per cent, in other places by 200 per cent. Between 30 and 200 per cent—well, you know that makes the difference between victory and defeat in the quantity which you turn out and place at the disposal of our armies."

The difference between victory and defeat—that, I take it, may in the end depend upon the relief which the railroads are able to get from labor union restrictions and legislative and commission restrictions, limiting output, piling up burdens, reducing resources, assailing credit.

Cash is to a business enterprise what blood is to the human body; without it life ends. Credit is to a business enterprise what virtue is to a woman; it is not sufficient that it be good; it must meet Cæsar's demand of his wife and be above suspicion.

The income account statements do not necessarily reflect the ability of the railroad to meet its cash obligations. The term "cash," so concise and so innocent, may embrace not only free working capital but moneys definitely required for sinking fund and other payments. It is a condition misleading alike to the commissions, to the corporate executive and to the investor. The working capital "necessary for the safe and convenient conduct of the business" of a railroad may be taken roughly at 10 per cent of its annual gross earnings. The Bradstreet Company reports that during 1916 "lack of capital" was responsible for 4,995 failures, being 30.3 per cent of the total failures during that year. Few things have so seriously involved business enterprises as the failure to provide working capital in adequate amount. Among the railroads, when the business is organized and under way, important as this resource is and subject as it is to varying and serious encroachments, it can in the main be nourished only from current income. Under the laws of most of the states, additional securities may be issued only for the purpose of acquisition of property, the construction, completion, extension or improvement of facilities, the discharge of refunding of lawful obligations, or the reimbursement of moneys actually expended for the foregoing purposes. This fund of working capital, its integrity dependent solely upon surplus income, may be drawn upon extensively by the hazards of business, such as washouts, fires, earthquakes and other catastrophes, and just now is being seriously impaired by the great rise in the prices of materials and supplies and the delays in their receipt, requiring the carrying of increased quantities in stock. An amount equivalent to about one-half the working capital of the railroads has been so absorbed in the inventory, and this condition constitutes a real menace in the situation.

Railroad Credit

The provision of moneys for the use of a railroad through the exercise of its credit is limited to a very small number of means—the first mortgage bonds; junior mortgage securities; income and debenture bonds; equipment bonds; short term notes; preferred and common stock.

(a) The number of railroads upon which first mortgage bonds can now be issued can be counted upon the fingers, so that at this time the issue of this class of securities is negligible.

(b) Junior securities, whether foreclosable upon failure to pay interest thereon or lacking such provision, as in the case of incomes and debentures, may be issued only and to the extent that the railroad shows a rate of growth in its net profits commensurate with the additional capital so to be invested in its properties. Such bonds become speculative securities if the net profits become barely sufficient to pay the interest thereon. The ability to market securities of this character, if they can be marketed at all or upon reasonable terms, depends largely upon the net profits remaining after providing for the payment of interest upon them, and it is upon this margin of safety that investors determine whether any given security affords a safe medium for the investment of their funds. If the interest is twice earned, the security may be expected to sell generally so as to give an annual yield approximately 1 per cent higher than the first mortgage bonds. If earning not more than one and one-half times, then the rate must be considerably greater. Unless there be a substantial margin, they can be sold only at a great sacrifice in price and the payment of a correspondingly high rate, if salable at all, which depends upon varying conditions and circumstances.

(c) The principle of the equipment bond is identical with that of the purchase of furniture upon the "instalment plan," and to the poorer companies involves similar hazards and hardships. Perhaps no one financial practice has so frequently involved the railroads in disaster as the free use of this method of credit. Under ordinary conditions moneys so obtained involve the payment of 20 per cent down and

*Government control temporarily may shelve the question of working capital and change somewhat the technique of dealing with labor problems; but the fundamental principles which are the foundation from which railroad problems should be viewed are not changed by the war expedient of government control.

anual payments of 10 per cent of the remainder, as well as the payment of interest, so that the liquidation of the loan thus obtained imposes upon the railroads the obligation to pay it off at the very burdensome rate of 14 per cent a year. At the present time, with the very high cost of equipment, running in some cases 150 per cent in excess of that prior to the war, these instruments cannot be generally utilized.

(d) Short-term notes are temporary borrowings running usually from six months to three years, the cost of which increases with the increased length of duration. They are at the present time practically the only instrument of credit available to the railroads and are, in essence, a bankers' accommodation rather than an investors' lodgment.

(e) The margin of credit for preferred stock may be approximated by combining the interest and dividend charges and considering the ratio between these combined charges and the net earnings available for their payment. If the combined interest and preferred dividend requirements are earned one and one-half times, a fair basis of credit is established. If the net earnings are double the amount, the credit basis would be high.

(f) At a time when the public was not only invited but urged to put its money into railroad properties, the common stock was offered as an opportunity for speculative profit. If it be assumed that, as distinguished from this, some fixed dividend rate is to be looked for, then it is obvious that both such dividend rate and the margin of safety in respect to earnings for common stock would necessarily, by reason of the greater risk of capital, be greater than that for the preferred stock. How much can only be determined by experience and by a consideration of other opportunities for investment open to prospective purchasers.

(g) Any consideration of the subject of credit would be incomplete that, besides noting the payments of the principal of equipment trust notes, failed to call attention to the amortization of bond and preferred stock discount and expense; to sinking funds for the extinguishing of mortgage and other securities; and to the effect of the provision for these payments upon the cash situation of the railroads.

Competition for Investment Funds

The railroads seeking to attract a portion of the investment funds are not monopolies but competitive enterprises.

The rate of growth in their passenger business for the past ten years has not kept pace with that of the freight business, notwithstanding a heavy reduction in their rates of fare, due largely to the development of the automobile, the seating capacity of the pleasure automobiles today being greater than the aggregate seating capacity of all railroad and traction cars.

The parcel post has invaded the field of the express and merchandise movement. The law contemplating a handling here similar to that in European countries of maximum packages of 11½ lb. has been so construed by the postmaster-general as to promote shipments of 50 lb. and further increases are in contemplation.

Road competes against road, facility against facility, commodity against commodity, community against community, while some agencies, such as the shallow waterways, are maintained at public expense, not as legitimate means of transport, but for the sinister purpose of breaking down railroad rates through their subsidized activities.

In few fields of enterprise is competition keener or the hazard of investment more dependent upon competence of management.

The railroad once constructed must remain where it is, notwithstanding conditions that may reduce or totally dissipate its profits, while capital once invested in it is immovably fixed.

Additions to plant and enlargements of service may be arbitrarily required by lawful authority, while all the advantages of large business, improved methods and economical devices may be swept away by arbitrary though lawful reductions in rates.

The natural timidity of the investor in railroad securities is excited to a panic condition by two prime causes. He sees:

	Per Cent.
the United States Government, through the Fuel Administrator, fixing the price of coke at an advance of	216
the United States Government, through the President, fixing the price of wheat at an advance of	156
the United States Government, through the President, fixing the price of bituminous coal at an advance of	115
the United States Government, through the President, fixing the price of pig iron at an advance of	105
and the United States Government, through the Interstate Commerce Commission, fixing the freight rates of the railroads at an advance of	4

So much he feels for the prospects of the future return upon the investment.

He sees, also, the United States Government engaged in a valuation of the railroads; a valuation that sees no value in cash on hand, the lawful money of the United States; no value in material and supplies on hand; no value in terminal facilities if organized under joint corporate enterprises; in fact, a valuation radical in origin radically administered.

So much he feels for the prospects of the future value of the property upon which the investment is invited.

Capital Requirements

All moneys available for investment represent savings. It is fashionable in some quarters to decry the institution of property, but it is upon the institution of property that our industrial civilization rests. The important fact about capital is not its unequal distribution or that some possess it in great amounts, but rather that some have had the wish, the determination, the self-sacrifice to save and that they have been willing to put their savings to the general use.

The total of railway capital outstanding in the hands of the public is reported by the Interstate Commerce Commission to have been in 1915 in excess of $16,000,000,000. The number of employees reported by the commission is close to 1,500,000, so that for each name on the payrolls of the railroads there is an approximate investment of $10,000, and each additional name added thereto must be predicated upon the provision of an additional sum of $10,000.

At the extremes of the list of those making investments stand the conservative and the speculative investor. Among the first are a large number (banks, insurance companies, trustees, executors, etc.) who by law are limited to securities meeting certain requirements, including usually, in the case of railroad bonds, the maintenance of minimum dividend payments upon stock for a series of years. A suspension of dividends would close this market and may lead to extensive selling. On the other hand, a forced recognition of the loss of all the equities from which speculative value rises would destroy the worth of the common stock, which constitutes that final margin of credit upon which all the other securities depend.

The Vital Need

Exaggerated statements are much in vogue as to the financial needs of the railroads. There is about $200,000,000 of maturing securities falling due in each of the next three years. If necessary, these could be extended by legislative enactment.

I do not believe that under present conditions the railroads can obtain, need, should have or could use any very considerable sums of capital funds. Their activities should primarily be devoted to and definitely subordinated to the winning of the war, and that is true also of the public they serve.

For this purpose no considerable additions to their fixed plant or equipment are necessary. Were they able to pay for and disposed to make such additions, the country would not be warranted in now taking on such additional burdens. Certainly no more should be spent for such purposes than can be paid for through the use of short-term notes or provided from surplus earnings under a proper rate structure. Should the margin for increased movement be exhausted, then in this country, as among our allies, shipments should be resolutely and remorselessly restricted. We are at war, at war for our very life, and the railroads must be accommodated to this condition, strengthened where strengthening is necessary, their use restricted where such restriction is necessary. At this time of war, "on the minute" service for pleasure and civil commerce is as much out of place as is wasteful living. What is vital is that the rate structure should be so fixed as to set at rest the fears of security holders, relieve the minds of the management of the fear of disaster, make the finances of the companies secure, their funds ample, their circumstances easy, their movements free.

World's Money Markets, Now and After the War

The Greatest Wisdom and Foresight Will Have to Be Exercised to Meet the Delicate Situation That War Has Brought About

By Sir George Paish

RARELY HAS THERE BEEN greater difficulty in coming to any definite conclusions as to the future course of the world's money markets, and were it not that the world's common interest was likely to induce, indeed to compel everyone to act with great consideration and with a quite unusual degree of wisdom, one would not be so hopeful about the future as the facts of the situation now justify. Actual experience of what has been accomplished during the present war fully warrants one in anticipating that any further difficulties will be safely overcome and that the world's credit system will emerge from the extraordinarily trying ordeal to which it has been subjected not only uninjured but greatly widened and strengthened. On every hand admiration is expressed for the wonderful manner in which money has been provided for war in all the belligerent countries and everyone now recognizes that such things would not have been possible but for the growth of banking and investment which had rendered the credit system prior to the war so powerful and so efficacious in supplying the world with the capital it needed for the development of its natural wealth and manufacturing power, as well as for the provision of the machinery of transportation and of distribution.

No more convincing testimony to the efficiency of the credit system in providing money for war is required than the fact that all the money needed to finance the colossal expenditures of this war has been supplied on the general comment that if so much money can be found for war then why not for improving the condition of the great mass of the people in all countries.

Certainly the credit system has attained a reputation in war which it will not be easy to live up to in peace, and it is partly because everyone now recognizes that bankers and investors in giving credit are able to create wealth that there is some uncertainty about the future. All the old landmarks and tide levels upon which bankers used to rely for guidance have been swept away by the great torrent of credit now sweeping over the world. It is obvious that the credit system of the past was merely a child in comparison with what it will be in future now that in the present emergency it has become fully grown.

When one considers how greatly credit has contributed to the expansion of the world's wealth in general and to the well-being of these countries in particular in which it was most highly developed before the war one realizes that after the war is over the well-being of the race will show a rate of progress never hitherto witnessed now that the possibilities of the credit system are so widely recognized; that is, provided that the war is ended by a democratic, clean and good peace.

To appreciate the course of the money market not only during the war, but after the war is over, it is essential to take the experience that is now being gained by the public into account.

The experience gained of war in these days shows that with everyone co-operating and with everything possible being done to facilitate the creation of credit both nationally and internationally there is practically no limit to the amount of money that can be borrowed both from bankers and from the investing public.

Of course, it is essential that we should all realize that at the present time these vast credits are not adding to the permanent wealth of the world and that for the greater part they are pure inflation, forcing up the prices of commodities, wages and profits. Nevertheless, they are attaining the end in view, the stimulation of human effort to produce things needed in a great crisis and to enable war to be waged on a scale never hitherto regarded as possible. Nor can it be denied that if the object in view had been the creation instead of the destruction of wealth that the world's well-being could have been enhanced in a most remarkable manner by such a vast creation of credit.

And no one can doubt that the world having had such an object lesson in the possibilities of credit will seek to apply its advantages after the war to the production of wealth and that as a result of this wider knowledge and appreciation of the power and the value of credit, wealth will increase much more rapidly in the future when the war is over than it did in the past.

Future of Money Market

It is the situation thus created that renders any forecast of the future of the money market a matter of very great difficulty.

One thing, however, is clear—that there will be no lack of demand for banking and investment money in all countries, both for the purpose of pursuing the war and, when peace comes, carrying out the work of reconstruction. The proportions of the sum required that will be provided by bankers and investors respectively cannot yet be decided. That depends upon many considerations. Just now investors in Europe are disposed to think that the war has entered upon its last stages and that the economic pressure upon Germany and Austria will at last have the desired result, and are rather more disposed to allow their money to accumulate in the hands of bankers until they can form

a clearer idea of how long the war is likely to last. The consequence of this is to bring about a plethora of banking money in London and to cause bankers to reduce the rates of discount and the government its rate for treasury bills. But already a greater attractiveness of government bonds in comparison with bankers' deposit rates and treasury bills is again causing investors to subscribe to the government loans more freely.

Fluctuations of this kind are, of course, inevitable and can be more or less ignored, the essential factors in the situation being the constant need of all the money that can be supplied both by bankers and investors in all parts of the world until the war is over.

After the War Conditions

In considering the post war situation, account must first be had of the position that the war will leave. First of all, we shall have the fact that the belligerent nations will be heavily indebted to the rest of the world for produce and foods supplied during the war, the payment of which they have been allowed to finance temporarily in the countries from which the things have been bought.

Of course, if the countries in which these temporary loans are incurred were to demand immediate payment of the money due to them a very awkward situation would arise. But they are likely to do nothing of the sort. In the past, these countries have obtained very valuable help from France and Great Britain in the shape of immense loans of permanent capital for the development of their resources and now that the situation is reversed they are likely to act with the same consideration as was shown to them, and to make no demand for payment which cannot be readily met.

What is likely to happen is that these countries which normally are borrowers and not lenders and need to import more goods than they can usually pay for by exports will, after the war is over, again begin to go ahead and will take payment of the loans they have made to other countries during the war in the goods they need for their development. In other words, they will gradually take back the capital which they have accumulated abroad during the war from their great sales of goods and produce and will not need to borrow from other lands until the money due to them is liquidated. In this way the balance of trade against the belligerent nations that has piled up during the war will be gradually adjusted until eventually the effect of the war entirely disappears and the world resumes business as usual.

The inevitable effect of this situation will be to maintain prosperity and the volume of business in the countries that are now greatly adding to their wealth and are in a position to ask for payment after the war for the produce and goods sold to the belligerents during the war. On the other hand, the need to repay these loans will compel the belligerent nations to become both economical and efficient in order to produce the goods they will require to export in order to redeem the debt they have incurred to other nations as speedily as possible.

Maintaining Present Prosperity

Possibly, but not probably, this temporary debt will be liquidated by sales of securities possessed by the warring countries whose holdings of foreign securities alone amount to some £7,000,000,000 ($35,000,000,000). But inasmuch as the countries to whom the money is due will for the most part need it for new capital expenditures not much of the debt is likely to be liquidated in this manner.

But whatever view in taken it is obvious that the international financial situation after the war will be a very complicated, not to say a delicate one, and will need to be handled with the greatest wisdom and circumspection.

Indeed, the importance of adjusting the financial situation will not be inferior to that of finding a solution of the economic situation. In Russia we see that food is plentiful in some parts of the country, while in other parts vast numbers of people are starving because they have not the means of purchasing the food they need. No very great difficulty would have been experienced in adjusting this situation had the rulers of Russia really wished to do so, had given a reasonable amount of thought and good will to the matter, and had applied themselves to adapting the country's financial machinery to its economic needs.

It is of supreme importance that a situation such as that now existing in Russia should not be allowed to arise in the world at large after the war, with consequences as appalling as, or even more appalling, that have been witnessed in Russia.

Already suggestions have been made to bring about an understanding between all the nations of the world for the purpose not only of mutual defense and protection against any aggressive country in future but also to deal with the grave economic situation likely to arise after the war when the peoples of the enemy countries will be prepared to bid for food and raw material at any price unless an arrangement has been already reached for distributing the world's supplies of the essentials of life equitably between the nations. And it is obvious that a similar understanding is demanded for dealing with the financial situation not merely for the purpose of dealing with the problems directly arising from the war but in order to provide the poorer nations of the world with the financial assistance they will urgently need in order to enable them to pay for the food and raw material they will want to preserve them from starvation.

AINT IT A GRAND AND GLORIOUS FEELING?

Making Our Resources Available for War

The Duty and Responsibility of the Individual American for the Successful Prosecution of the War

By John E. Oldham
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THE great responsibility which the United States assumed by its entrance into the war, while not fully appreciated at the outset, is becoming more generally recognized with the progress of events from day to day. That the government has enormous tasks before it the necessities of which must be stated in millions of men and billions of money is a fact of which the significance is not easily comprehended.

It is vaguely understood that the resources of the country must be mobilized, organized and regulated, and that this involves a change from a nation of individual effort to a nation preparing for a serious, if not a desperate struggle for its own preservation. It is not difficult to understand how the work which is to be done by the army and navy will contribute to winning the war and to understand the importance of the activities that support them in the way of supplies, ships and hospitals. It is, however, difficult to see and appreciate the extent to which these activities are dependent for their success on the everyday activities of the balance of the people.

It is obvious that activities directly connected with the war will require the combined efforts of an immense number of people, and every day sees a great number of persons in civil life leaving their former occupations and taking up posts in the service of the country; placing themselves behind the army and navy in various ways and becoming part of a great national organization. Yet, except as war activities occasionally reach out to the individual in the form of a suggestion by some regulating body as to conservation of coal or food, or an appeal for funds or supplies for hospitals or relief work, the average man or woman has a feeling of detachment and of bewilderment in the magnitude of events that are taking place, and of insignificance and helplessness in finding any definite way to be of service. Nevertheless, in spite of the fact that every individual cannot be directly associated with government activities or with great organizations which supplement the government, he can be a part of the machine which is to carry on the war. On his own initiative and without association with others he can give as much faithful service, and as much assistance, and bear as much responsibility as if he wore a uniform or received his orders directly from a superior in the government employ.

The part which individual service accomplishes is difficult to understand unless considered in relation to the whole situation. Considered in this way it should be evident that effective service at the front is made possible only by service behind the lines; and the most valuable service behind the lines consists in making the resources of the country available for war.

Every effort, therefore, which serves to make them available—whether it is an effort to produce or conserve—is a direct contribution to winning the war. To make resources available which otherwise might be lost through waste, extravagance, or imprudent use is the primary purpose of the nation-wide campaign for thrift and economy; for resources which are made available through savings are as valuable as those which result from increased production.

The importance of thrift and economy in effectively organizing the country for war becomes evident "if we think of finance in terms of labor instead of in dollars," as suggested by Mr. Everett Morss, of Boston, in his pamphlet entitled "Patriotic Economy"; the term labor as used and defined by him being understood to mean "personal service, whether of brain or of brawn, of the forty million of us who are engaged in gainful occupations."

The resources of the country can be made available for war only by the use of labor, and it is therefore clear that labor which is employed to perform tasks which are not absolutely necessary, which benefit the individual only, or which might be deferred, cannot, at the same time, be at the disposal of the government.

While the amount which can be contributed by the efforts of any one individual when considered by itself may not appear to be of great importance to the situation, yet it must be recognized that the efforts of millions of people when combined and taken collectively become a tremendous force. Failure to recognize that these facts apply to the present situation would appear to account largely for the difference of opinion on the part of the advocates of "business as usual" in war times, and those who contend that economy and thrift are factors of the greatest importance in the prosecution of the war.

The following illustrations are presented with a view to showing what it means in a practical way to utilize the full resources of a community or nation, and with the hope that they may serve to bring about a better understanding of the valuable and helpful service which can be performed by those not engaged directly in war activities.

Let us assume a community with no purpose except existence from day to day, making it necessary only to provide food, shelter and clothing. Let us further assume that the labor required both for production and distribution prorated over the whole population accomplishes the desired results by all working four hours a day.

If one-half of the people of this community were willing to work eight hours a day, this would permit the other half to remain idle.

Again, let us assume that one-half of the people are willing to work eight hours a day and continue to have no thought beyond their day-to-day requirements, but that these requirements are extended to include some kind of pleasure or luxury which does not increase efficiency or add to the general welfare of the people as a whole. Further, that the services of one-half of the people for eight hours a day are necessary for this additional requirement. In this community we would have labor fully employed; eight hours of labor being required of one-half of the people to provide the necessities and eight hours of labor being required of the other half to provide luxury and pleasure.

Now let us assume a community of more progressive people with aims beyond the immediate satisfaction of their daily necessities, denying themselves pleasures and luxuries, and unwilling that any part of the population should remain idle. We might again have one-half working eight hours a day to supply the physical necessities of the whole population, and the remaining half—instead of staying idle or instead of being employed in furnishing pleasure and luxuries—devoting its efforts to furnishing better living conditions, and ways and means of increasing production which will

eventually save labor, and producing a variety of other things which will serve some useful purpose in the future. With increased productive capacity the necessities of living would be supplied with less effort in the future, thus requiring the efforts of a smaller part of the population; the number available for employment in doing things which add to the comfort and welfare of the whole community would be automatically increased; the cumulative efforts of that part of the population not required to furnish the necessities would be the surplus production or savings of the community put into a form which would represent permanent wealth.

In the Case of Emergency

Let us consider that a disaster of some kind threatens these communities and for protection it is necssary in each instance to make use of every available resource. In considering this matter let us assume for the purpose of illustration that an eight-hour day is the limit of the capacity of the individual for the most efficient service and, further, that the resources when made available are most efficiently used.

In the first illustration the hours of labor would be increased for the whole population from four to eight hours. In the second a day's labor would be required of one-half of the population which would otherwise be idle. In the third labor would be diverted from the requirements of pleasure and luxury, and in the fourth labor would be diverted from activities which for the most part are devoted to the increase of permanent wealth.

This broad classification of the employment of labor applies as well to communities whose activities are varied and complex as it does to those where the activities are more limited and simpler in character. The composite of the four illustrations above results in a situation which is not unlike the situation of this country to-day. There is need for mobilizing our entire resources, and if we exclude for the time being such important additions as would result from the elimination of waste and an increase in hours of labor, the extent to which the resources of the country are made available for the prosecution of the war will be measured by the extent that labor now devoted to purposes other than the necessities of everyday life is made available for use by the government.

A difference of opinion may well exist as to what constitutes the actual necessities, what amount of effort should go to furnish necessary recreation and pleasure which serve to maintain health and to further efficiency; what enterprises should be promoted and what should be postponed; whether the curtailment of the production of things which are not essential to carrying on the war should take place immediately or develop gradually. Whatever difficulties are presented by these considerations are difficulties which have to do with the application of the principle and do not involve the principle itself.

A Service Everyone Can Render

The conclusion is inevitable that it is possible for everyone to render the government a service of first importance not only by reducing his personal requirements to the necessities, but also by the frugal use of these necessities, in order that the labor of the country as far as possible may be devoted to industries connected with the war.

A further service is the transfer of the control of labor which is thus made available, for it cannot serve the purposes of the government until the right to its use has been relinquished by the individual and transferred to the government. This service is the help which is contributed through the payment of taxes and by the purchase of government bonds. It may be noted that the payment of taxes calls for the permanent surrender of the right to the use of a given amount of labor without compensation and is compulsory, and not voluntary. The purchase of war loan bonds, on the other hand, is a voluntary act and consists of a temporary surrender of labor with compensation for its use; the right to this use to be restored at some future time.

This transfer to the government of the right to the use of labor involves a financial transaction and is usually accomplished by the use of banking facilities. As all financial transactions of large amounts are handled in this way it will suffice for the purpose of illustration to consider this method as covering all transactions. A practical application of the foregoing may be seen from the following illustration adapted to an income of $5,000.

When we say that a man has an income of $5,000, we mean that he will receive in the course of the year the right to use labor for such purposes as he may choose to the extent of that sum of money. He may find that one-half of this amount, or $2,500, will be required for labor to provide his necessities.

Perhaps he will be required to turn over a further amount of $200 worth of labor to the government in payment of his taxes. With $1,300 of the balance he may purchase labor to provide him with luxuries and pleasures, and the balance of $1,000, for which he had no immediate use, he may keep in the form of a deposit in his bank to be assigned temporarily to the use of the bank's customers; or he may decide to turn this amount over to a railroad or to a municipality by purchasing a $1,000 railroad or city bond; thus lending to the railroad or the city the use of $1,000 worth of labor which will probably be used for construction of a permanent nature and thus add to the wealth of the community.

Disposition of the Surplus

It will be seen that after providing for the labor which supplies his necessities and the labor which he is required to contribute for the support of the government, he has the disposal of $1,300 worth of labor, which may be used for luxuries and pleasures, and $1,000 worth of labor for which he has no immediate use. It is the labor which can be used for these purposes, which in this case amounts to $2,300, that the individual can put at the disposal of the government, in one form or another, and if he can reduce his necessities this amount may be still further increased.

Assuming that this $2,300 exists as a bank deposit and is to be placed at the disposal of the government, the transaction is accomplished by the purchase of government bonds. This is equivalent to a transaction which results in transferring to the government the right to check against the bank account and the consequent release of any claim upon labor which it carried with it. The amount in the bank account remains unchanged by the transfer. It will still be used for the employment of labor, but the labor will be used by the government for purposes connected with the war. As a matter of fact, in its final effect a purchaser of government bonds temporarily loans labor to the government and merely postpones until a later date the full use and enjoyment of that labor for his own purposes. It is obvious that money enters into the transaction merely to facilitate the transfer of the right to the use of the labor.

With these principles in mind it seems clear that the individual—even though he is not directly connected with war industries or activities which are primarily war activities—is, nevertheless, a most important and necessary part of the machinery for carrying on the war; and that the measure of his contribution to winning the war will be determined by the extent to which he conserves his resources and makes them available for the use of the government.

While great emphasis was placed upon the importance of everyone subscribing to our recent war loans to the extent of his ability, the fact should be kept in mind that these

subscriptions serve only as the agency for transferring labor resources from the individual to the government, and cannot be of real value unless they fulfill this purpose.

Subscriptions based on money borrowed from the banks make no transfer of this kind at the time of the subscription and consequently do not increase the resources of the government in any way unless and until the loans themselves are liquidated by accumulated savings. It follows that subscriptions which were made with the intention of liquidating the loans by selling the bonds, instead of by accumulated savings have not served directly, at least, a permanently useful purpose. These subscriptions have merely resulted in placing the government in a position to enter the market in competition for the existing labor supply, and this could have been accomplished as well by the government making arrangements to borrow from the banks without the intervention of the individual. The economic effect is the same, whether the government borrows directly or through the individual. In either case the demands for labor result in higher costs for labor and higher prices for the things into which labor enters, thus correspondingly increasing the cost of carrying on the war.

At best, these increasing costs cannot be avoided entirely as the supply of labor during the war will be unequal to the demands of both the individual and the government, but they can be substantially minimized by the individual decreasing his demands for labor for his own purpose. When this is fully accomplished, and not until then can it be said that the country is efficiently organized for war and that the business of war is the sole business of the country.

Vast as are the resources of this country they are not unlimited. They cannot be made to do double duty; they cannot supply the luxuries and comforts of living to which people are accustomed in times of peace and at the same time provide for the necessities of war. The responsibility of making these resources available for the purpose of the government rests on no individual or group of individuals. It is a responsibility which concerns the whole people and can be met only by personal sacrifice and self-denial on the part of each and every one.

Government Operation of Railroads: Legal Aspects

Owners' and Creditors' Rights Are Almost Wholly Subordinated to Expediencies of the Government

By Roberts Walker,
White and Case.

THE FIRST THOUGHT of the average lawyer is that there are *no* legal aspects to our present governmental control of railroads. The actual taking over was a matter of war necessity, not of constitutional prerogative. Built upon this undeterminable power, the superstructure may or may not bear some resemblance to the body of adjudicated and statutory rights with which lawyers are conversant. At any point the paramount Federal authority may change or ignore some rule of law, no matter how definitely established. And in so doing, the Federal power might nevertheless be functioning in accordance with what was best for the nation and the railroads alike.

It would be hazardous to forecast the future of our Federal commandeering. It has not proceeded far enough to develop settled principles. It is still largely in the phase of investigation and correlation. The direction of the entity has hardly begun; the vertebrae and ribs of the Government's transportation beast are not definitely located. The statutes and a few instances are all that we can examine.

Contemporary Statutes

The general appropriations act of July 1, 1916,[1] gave the Interstate Commerce Commission $3,500,000 with which to continue valuation work and secure information as to "stocks, bonds and other securities," carrying forward this dubious task. The Newlands Commission was created[2] to investigate the carriers. The Council of National Defense was[3] required to investigate the railroads, looking to their co-ordination for defense and commerce. All this legislation was passed eight months or more before the United States declared war.

Controlling Statutes

Inserted[4] between provisions for a bridge at Fort Riley and for horses for the militia, is the following:

> "The President, in time of war, is empowered, through the Secretary of War, to take possession and assume control of any system or systems of transportation, or any part thereof, and to utilize the same, to the exclusion, as far as may be necessary, of all other traffic thereon, for the transfer or transportation of troops, war material and equipment, or for such other purposes connected with the emergency as may be needful or desirable."

The mental picture evoked is the temporary, emergency use of a route of travel—railroad, steamship or highway—to carry troops or munitions from Waco to Galveston, or from Pittsburgh to New York. There is no suggestion that railroads off the usual routes of such movements will be taken. All "other" purposes are "purposes *connected with the emergency.*"

The statute used three basic words:

Possession,
Control,
Utilize.

The President's proclamation of December 26, 1917, added a weighty fourth word, "operation," and directed that the

Possession,
Control,
Operation and
Utilization

should be exercised by the director general.

The only purported authority for the commandeering of railroads generally, as far as this proclamation discloses, is the quoted language from the two joint resolutions[5] declaring a state of war with Germany and Austria-Hungary, wherein "all of the resources of the country are hereby pledged by the Congress of the United States." These words cannot be said to constitute a taking-over; they doubtless

[1] 39 Stat. 262, 281.
[2] Joint Res. July 20, 1916; 39 Stat. 387.
[3] Act of August 29, 1916; 39 Stat. 619, 645.
[4] 39 Stat. 649.
[5] Of April 6 and December 7, 1917, respectively.

reflect the feelings of every right-minded citizen, but, viewed as a statute, they lack all requisite provisions respecting compensation, without which such an enactment is idle under our constitution. Thus the initial operation of railroads, in so far as not clearly for "purposes connected with the emergency," had no statutory warrant. Nor, it is hardly necessary to add, has it any constitutional foundation: the Congressional rights "to regulate commerce" and "to establish . . . post roads," even if pertinent, have not been invoked by Congress.

Such was the statutory situation on December 28, 1917, when the railroads were actually taken over.

These comments are made in no controversial spirit, but we should realize how far the executive took unto itself powers not wholly supported by legislation. From its practical side, it was better to commandeer the railroads "all or none." From the governmental view-point, the effective way, and the fairest method to each railroad, was to take them all.

It is plain that those in authority have themselves given some thought to these conditions. In the compensation statute,[8] passed nearly three months after actual possession and operation had begun, there are patent efforts to correct the statutory situation by express ratification or acquiescence. "The President having in time of war taken over the possession, use, control *and operation*," are the first words of section 1. By section 9, the provisions of the act of August 29, 1916, "except as expressly modified and restricted by this act," are kept in full force and effect, "and the President in *addition* to the powers conferred by *this* act, shall have and is hereby given such other and further powers necessary or appropriate to give effect to the powers *herein* and *heretofore* conferred. The provisions of this act shall also apply to any carriers to which federal control may be hereafter extended."

Thus the statutory state of affairs, in somewhat backhanded and *nunc pro tunc* fashion, has been made nearly satisfactory. That to which Congress expressly submits may perhaps be deemed to be that which Congress expressly authorizes. And any constitutional objection is met at the threshold by the manifest effort to provide adequate compensation and due hearing as to its adequacy. Federal operation is in the saddle, under conditions which no one will or should attack. For the best prosecution of the war, this great experiment must be given most thorough trial. In a number of cases, the compensation formula would work injustice, but means are provided for special treatment of special cases. There is likely to be some friction as to what may properly be charged to expenses; a symptom of this is the attitude already announced regarding fiscal offices in metropolitan cities, off-line counsel, etc. It is only natural that the Government, being entitled to the net revenues, should seek to enhance them by forbidding questionable deductions from gross revenues. Whether it necessarily follows that proper expenses disallowed by the director may justly be saddled upon the railroad's compensation is a question awaiting settlement. It may well be that the federal authorities will discover that successful operations will not by themselves restore railroad securities to the favor of investors. If the government should contemplate public sales of railroad bonds, it must give heed to the marketwise features to which investors are now thoroughly wonted, and provide (in the same spirit with which it has handled the Liberty Loans) convenient paying offices, registration, "splitting" facilities, and all the rest. The modest cost of the average eastern fiscal agency of a southern or western railroad is ordinarily quite justified by its importance to the general standing and marketability of the securities.

These and other areas of irritation are, however, only the growing pains of a nation just attaining stature as a warrior.

[8]Act of March 21, 1918.

The corporations are all kept alive. They are merely ousted, temporarily, from the possession of their properties. Counsel for the director general likens his possession to a "lessee interest." While not a totally correct picture, the analogy is close enough. Each carrier corporation has become a landlord. It trusts that it owns a reversionary interest, but is not certain. Considering the involuntary nature of the arrangement, the director general's estate is more like that of a receiver; but reasons appearing elsewhere will indicate why that analogy may be distasteful: it involves possible clash with receivers already existing, while the government must assert paramountcy.

At all events, the corporation is to receive a cash compensation, which its directors in proper cases may distribute to stockholders by way of dividends. Prudence will dictate what part, if any, of the compensation must be accumulated against the day when the carrier gets back its property. The policy exercised by the director as to additions and improvements, in a given case, may thus be reflected in the rate of the dividends distributed.

Rights of Bondholders

The intention of those in authority seems to be that the rights of bondholders shall not be affected. It is true that one great right—that of holding the mortgagor accountable under its covenants to repair and improve—has been swept aside. But the right to receive payment of interest and principal remains unaffected. So, also, *probably* does the right to foreclose in event of default. We say "probably." On the analogy of the lessee estate, there should be no difficulty in foreclosing and selling subject thereto. As a bare theoretical matter, that is. But as a practical matter, there may well be a distinction and a difference. The courts will give weight to the fact of the director's possession, and presumably to his wishes as to the form and manner of sale. There may be questions as to whether improvements, not paid for by the carrier but by the director, though clearly intended to be covered by the granting clauses of the mortgage, will pass under the sale. And, as foreclosure usually involves reorganization, the director will be a further party to be consulted as to the form and terms of new securities, and the application of their proceeds.

Effect on Receiverships

When the director general assumed possession, several railroads were in the hands of receivers. On its face, the judiciary had control of these railroads, to the exclusion, on the theory of concurrent jurisdiction, of the executive, because the judiciary had exercised its power earliest. No clash is likely, it would seem, to develop on this point. The judiciary will probably lay aside its technical position, and look at the matter from a national viewpoint, recognizing a paramount right in the executive in the stress of war.

A subservient attitude on the part of the courts would not, however, fully meet the equities of the occasion. Suits are in progress to enforce bonds or equipment trusts—real contract rights, acquired for value in good faith, which the government should be no less anxious to safeguard than are the courts, if the securities of railroads are to maintain and improve their investment position. These litigations will of necessity proceed and must some day reach the stage of decree. Perhaps the next development will be in the form of decree. Instead of the foreclosure and sale, the courts may decree the *reorganization*, providing what new securities shall issue and on what terms they shall be exchanged for the old ones. Such a decree would accomplish everything possible during possession by the director general, since a sale subject to his possession would be a rather fruitless proceeding, and the question of rehabilitation expenditure is in his hands rather than those of the reorganizers. The fear of not barring dissentient

bondholders unless a sale be had, should be largely abated: that which is adjudicated with the sanction of the federal authorities will hardly be attacked successfully if and, or when federal control shall have ceased.

Closer at hand is the question of the correct posture of the receiver himself, *vis-a-vis* the director general.. Theoretically the receiver is an "indifferent person" through whom the court seeks to manage justly for all interests concerned; practically, he responds to the preponderant groups of securityholders who are seeking the court's aid. In either case, he represents a viewpoint athwart that of the director general, who is operating for the nation during a crisis. Receivers will therefore have to decide whether to become the operating subordinate of the director, or to remain the manager for court or creditors. Upon electing the latter, the receiver will be shorn of all operating duties and powers, for these the director must control, and will become the custodian of non-operating assets, some few other sticks and chattels, and possibly of the government compensation. The courts will probably be amenable to suggestions of this character.

The Case of "Denver"

The director general had assumed possession before the application for a receiver of the Denver & Rio Grande Railroad. The court proceedings then marched up the hill and down again.

A general creditor filed a bill for a receiver, and the railroad answered, confessing and consenting. A hearing on the appointment was ordered. At the hearing, the Equitable Trust Company, with its $38,000,000 judgment on the Western Pacific guaranties, was present. The director was represented only by a letter from his counsel. The court order was prefaced with a paragraph recognizing the possession of the director general, and went on to appoint receivers in the customary manner. This did not suit the director, whose counsel wrote to the court stating it to be "necessary that a line be drawn between the federal control and the receivership; that is, that the receivership deal with the corpus and with the assets belonging to the road at the time of the effective date of the proclamation. That the operation . . . of the railroad as a going concern shall be under the direct charge of the director general and not in any way affected by the receivership." The counsel outlined the precise steps desired, and the court obediently entered a new order, pursuant to which one receiver resigned to become the director's operating agent, while the other receiver was relegated to a custodianship of non-operating assets and of government compensation.[7]

This brief history is expressive of the director's policy toward receiverships. While to the conventionally minded it would seem to ignore established rights of securityholders and creditors to the administration of their debtor's affairs by courts of equity, the necessity from the government's view-point of unified complete control will probably be accepted as entitled to the right of way over all usual considerations.

Rates

By the compensation act, the President "may initiate rates, fares, charges, classifications, regulations and practices," immune from suspension. The Interstate Commerce Commission may, however, hold hearings on such tariffs, upon complaint, and make and enforce orders respecting same; but the commission must give weight to any recommendation the President may transmit as to the need for this or that increase.

This is a great step toward equitable tariffs in this country. For years we have gone on adjudicating as between one destination and another, or one producer and another. But the real problem has never been touched. There has been no disinterested manner in which rates could be fixed as between one commodity and another, no authority which could keep desirable water competition from being killed out, no power to eliminate many underlying principles sanctioned by long practice, but not invariably just or reasonable. The opportunity for scientific treatment of rates and practices has at last arrived, and the greatest good or evil to the shipping public will depend on the use made of these tremendous powers.

The 15 per cent increase granted by the commission about the middle of March, while welcome, is an illustration of what ought soon to be regarded as an antiquated and barbarous method of dealing with the rate fabric. A general 15 per cent raise cannot fail to intensify every existing disparity as between commodity and commodity, classification and classification. It is to be hoped that this will be the last rate increase of the "horizontal" variety.

General

He is wise who can, and bold who will, prophesy the course of events in railroad properties. Inspection of the present factors, however, indicate a few principles:

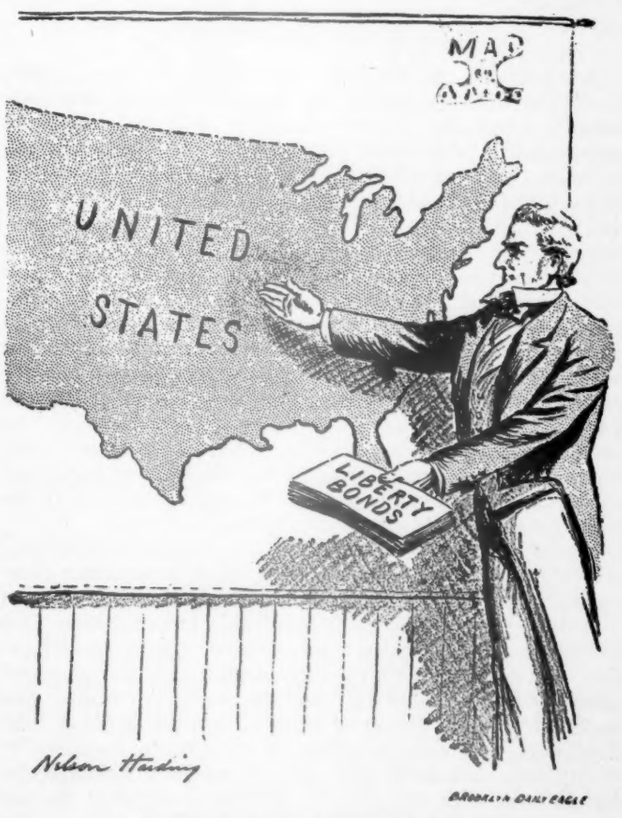
(a) Each corporation is being preserved as such;

(b) Securities are being recognized and not disturbed;

(c) There is no talk, as yet, of conveyances or consolidations or mergers, of reincorporation, or of dissolutions;

(d) The regulative methods are built upon the existing scheme of things, and no upsets or sweeping changes are suggested.

These and other signs can be read to indicate that the properties will go back to their owners when the war emergency is passed. They are not symptomatic of government ownership, but merely of government rental and tenancy.



"THIS IS YOUR SECURITY"

[7]Not then provided by statute; the court's phrase was "all rights and powers which may be hereafter created in favor of said . . . Railroad . . . by Act of Congress or otherwise."

Banking Institutions to Finance Our Future Abroad

Establishing Foreign Branches Is Not as Effective as Forming Affiliations or Partnerships With Separate Banks

By Albert Breton,
Vice-President in Charge of the Foreign Department of The Guaranty Trust Company of New York.

TO CONTINUE TO HOLD the commercial and financial supremacy we have gained through the war, our merchants and manufacturers must become thoroughly and practically acquainted with the financial machinery for marketing and distributing their goods both at home and abroad.

One of the chief obstacles to the extensive development of our overseas commerce, in fact, has been a more or less general unfamiliarity on the part of our manufacturers with the means that our banks afford for the financing of this business. Another handicap to our progress in the lucrative fields abroad, which will be more important than ever when peace is established, has been the inability or disinclination of our exporters to grant the credit terms demanded by foreign reliable buyers. It is certain, for instance, that our exports to Latin America will not reach their peak until we extend as favorable terms as our competitors.

Bank credit bridges the gap between the raw material and the finished product—between production and distribution. There is no mystery and little complexity about financing foreign trade. The principles are the same as in domestic business. There are only the differences of language, differences of currencies, and the greater distances. A shipment of cotton from the United States to England will illustrate how the financing of exports is conducted under ordinary circumstances.

How Exports Are Financed

An importer in England desiring to purchase cotton in this country first goes to his bank in England and establishes a credit for a certain amount of money, which he estimates will be sufficient to cover the purchases he is about to make. He next instructs his agent in this country to purchase for him a certain amount of cotton and to draw sixty and ninety day drafts on the English bank where he has previously established his credit. These drafts are drawn in English currency, viz., pounds sterling. As a ninety day draft in pounds, shillings and pence, payable in London, would not be acceptable to the cotton grower in payment for his cotton, the American buyer arranges with one of the large banks in New York, New Orleans, Galveston, Savannah, or some of the larger cities to take these drafts and pay for them in United States currency, so the grower can immediately receive payment in money he can use. The buyer may make such arrangement with a local bank and the local bank may in turn make the arrangements with the larger bank, but this is a minor detail.

So far the transaction is simple, but now comes the phases which require expert knowledge, foresight and sound judgment. These sixty and ninety day drafts carry no interest and the sixty or ninety days begin only from the time such drafts are accepted by the manufacturer in England. Therefore, the bank purchasing such drafts must calculate the number of days it will be "out" the use of the money; that is, the time which will be required to send the drafts to England and have them accepted, in addition to the sixty or ninety days they must run after acceptance. This calculation is necessary not only to include a sufficient interest charge during the time the bank is "out" the money, but also for reimbursement of the principal itself. After the New York bank has made these calculations, it is then in position to advise the cotton buyer, or the local bank, of the rate of exchange or the amount in United States currency it is prepared to pay for the draft drawn in foreign currency. The grower does not care anything about all this foreign figuring and calculation, as he simply sells his cotton at so much per pound, yet this process must all be gone through with and the machinery must be there or he could not get his money without great delays and unwarranted risks.

Larger Banks Have Better Facilities

The question is not infrequently asked, "Why could not the local country banks send the drafts direct to the English banks without making use of the large banks in New York, Chicago, New Orleans and other cities?"

There are many reasons why the local country banks are unable to do this, the principal reasons being the following:

The local banks have not sufficient capital and deposits to await the maturity of any considerable amount of drafts or even the time necessary to send them to Europe for acceptance, so that it is to their advantage to handle a greater amount and turn them over quickly at a moderate profit. Even the largest banks in the United States have not sufficient resources to hold all of these drafts until maturity. They sell, or discount them in Europe at every favorable opportunity, so they can be in position to take care of the constantly increasing demands on them.

These drafts are drawn by a great many people on a great many banks, and the credit and standing of the drawers, the drawees, and foreign banks must all be carefully looked into and watched, so that loss is not sustained through fraud or failure. This requires a credit department and extensive system of credit reports which a small bank could not support.

It requires the undivided attention of a highly trained expert to deal successfully in foreign exchange and a small or even a moderate size bank could not afford to pay for the services of such a man.

The larger the bank, the better facilities and the more economical in conducting the transactions, with resultant good to business generally. While a comparatively small number of banks deal directly with the European banks, there is hardly a bank in the United States which does not have transactions that are a direct result of exports or imports and the larger banks are the channels through which these transactions ultimately find their way to foreign countries and make it safe for the bankers of the country at large to finance shipments of products to foreign countries.

Necessity for Co-operation

Unless American bankers extend their foreign banking business our manufacturers, exporters and all those who are directly or indirectly allied with them will be seriously handicapped not only in promoting our foreign trade but also our domestic commerce, for the two latter are interdependent. But before foreign banking can be extended and before we can reach the object we wish to attain, many things must be done. Some of them are now being accomplished.

To extend our foreign banking we need, first of all, co-

operation. We must not attempt to extend our foreign banking by individual efforts. Our bankers must go abroad hand-in-hand, like brothers, like soldiers in a common cause, presenting a solidly united front, joining hands to build our foreign trade. Unfortunately the principles of democracy sometimes are opposed to co-operation. This government has been built on principles of decentralization, and this independence of powers and rights sometimes means antagonism to co-operation when it comes to foreign trade and international finance. Our Sherman anti-trust law, for instance, prohibits co-operation among manufacturers. It has been a criminal offense for manufacturers, producing a similar line of goods, to combine to sell their products in a foreign country, even though they do not agree to uphold prices, but simply desire to build up their business for their mutual benefit. The new Webb bill, however, provides very judiciously and patriotically that manufacturers may go abroad and work together in foreign commercial fields.

Merchant Navy Needed

Another thing that we need is a merchant marine second to none. We cannot have foreign banking without foreign trade, and foreign trade cannot be obtained without a merchant marine. We are building great fleets of ships, and, I believe, that the American merchant marine will be one of the most important benefits conferred upon us by the war. Strange to say, every calamity has some good result. The Spanish-American war, for instance, disclosed to us the need for the Panama canal when the Oregon had to go around Cape Horn. Our panic in 1907 showed the necessity for the Federal Reserve system, and by good fortune the Federal Reserve system had just been put into operation when this country was called upon to play such an important part in handling the finances of the Allies. Now this war has come, and this country is paying its very large part of the bill, but we are going to have a merchant marine, which will insure foreign trade, and consequently, foreign banking. The day the United States is rendered independent of foreign shipping by its merchant marine, as its accumulation of gold makes it independent today of foreign credit, we will have no difficulty in maintaining our place in the first rank among the great nations of the world.

American Leadership

I am firmly convinced that after the war we will play a prominent part in international banking and financing. We cannot expect our Allies to be able to pay on demand all the loans they owe to the United States. Our power arising therefrom will not be abused, but it certainly will entitle us to considerable influence in international conferences. Countries like Argentina, Brazil, China, and others will seek the co-operation of the United States, and will come to us because we will be in the best position to supply them with the things they may need commercially and financially. We will play, therefore, a very important part in foreign finance, and handle a large volume of foreign banking business. Instead of British, French, Belgian and German banking syndicates financing China exclusively, and instead of international industrial groups in China, composed only of Japanese, British, French, Swiss and German concerns, there will certainly be American participants. The British, French, Japanese and other foreign bankers will be glad to take us in as their partners. As it is our duty to help them today as our Allies, it will be our reward after the war to have them recognize our financial institutions as entitled to a prominent place in the world's finances.

There are opportunities for foreign banking in every country. There are many different ways in which business can be developed. One of them is the branch banking system which is very well developed in Great Britain, in Canada, in France and in Italy. In Canada there are half a dozen leading banks which have branches all over the country. In England the big clearing house banks are established everywhere. They are daily increasing the number of their branches in every town, by absorbing local banks or by setting up new offices. In France there are three or four banks with branches all over that country.

Foreign Branches

The national bank act of the United States, however, does not permit a national bank to establish domestic branches, neither does the banking law of New York state permit a state bank to have branches in the state. But New York state banks or trust companies may establish foreign branches after obtaining the approval of the state banking department. National banks may establish foreign branches, too, with the approval of the Federal Reserve Board.

The branch bank system which has proved a great success in Great Britain, Canada, France, and Italy, so far as local business in those countries is concerned, has not proved so satisfactory when extended abroad. On the other hand, foreign trade banks with foreign branches have been quite successful.

The large British banks have very few foreign branches, although an erroneous impression to the contrary seems to exist here. Lloyds Bank has a branch in Paris, which is really a separate company, although it bears the same name. The London City and Midland Bank, the largest commercial bank in Great Britain today, has no foreign branch. The Bank of Montreal, and the Canadian Bank of Commerce have no foreign branches outside of the United States and Mexico. The Royal Bank of Canada has branches in the West Indies, and has specialized in certain territories under the protectorate of Great Britain and the United States. It is only lately that it has been going to other foreign countries, such as Venezuela, Costa Rica and Spain.

The French and Italian banks have few foreign branches; but all the big banks of these two countries have affiliated institutions. In other words, they work on the principle that the world is divided into different races, into different commercial sections, and that to handle business in different sections, like Latin-America, the Orient, and in the colonies, it is better to establish a bank specially fitted and organized to handle business in the countries pertaining to each of the foreign groups.

The American banker today is confronted with the problem of how to extend his foreign banking business. He can solve the problem by establishing his own foreign branches, or by establishing special banks in the different countries of the world, or by forming partnerships or affiliations with foreign local banks. Which of these methods is best? When it comes to management and handling of business, I believe, as stated above, that each section of the world should be considered separately, according to its race, its laws, its customs, and its commerce.

There is the Mercantile Bank of the Americas, for example, which has been established to handle business principally in Latin-America, with branches in Paris, Genoa, and Barcelona. It has banks affiliated with it—not branches—which it controls in North Brazil, Venezuela, Ecuador, Peru, Nicaragua, and Colombia.

The Mercantile Bank of the Americas is composed of the Guaranty Trust Company, Brown Brothers, J. & W. Seligman and Company, the National Shawmut Bank of Boston, the Anglo and London, Paris National Bank of San Francisco, and the Hibernia Bank and Trust Company of New Orleans. Thus it is an association of banks controlling extensive foreign business, and I am inclined to think that this system is going to grow to a much larger extent as soon as the laws of the different states are amended so as to allow

different banks to work in co-operation and join their efforts to develop our foreign trade.

Neglected Possibilities

Our general lack of knowledge regarding foreign banking has been largely due to the fact that this is relatively a new country. Prior to the beginning of the great war we were occupied in developing our own business, our own resources, in building new factories, and in constructing new railroads. We were busy in the making of this wonderful commonwealth, which today has attained a pinnacle among the powers of the world. Therefore we may be excused to have overlooked the possibilities of foreign banking.

American bankers in general looked upon foreign banking as a special science having no points in common with domestic banking. They thought it required different business methods, and that it would require much study to understand them. Even today, outside of New York and some of the other big cities, most of the bankers think of foreign banking as something wonderful. Apparently they believe that unless they can speak Chinese, or Japanese, or some other strange language, they cannot tackle foreign banking. This, however, is not so. There is no wide difference between foreign banking and domestic banking. There are differences in laws, in customs, and there are differences in moneys; but fundamentally, the principles of foreign banking and domestic banking are the same.

Banking is a matter of receiving deposits, of extending credit, and of making loans and collecting them. There is no difference between making a collection on San Francisco and in making a collection on London. It amounts to the same thing. There is no difference between lending money on an ocean bill of lading covering cotton afloat to Liverpool, and in lending money on cotton warehoused in Memphis or Dallas or Savannah. It is simply a question of whom you are dealing with.

Functions of the Foreign Bank

What does a foreign bank do? It lends money, it extends credits, receives deposits, and makes advances on documents. There is no difference in handling a warehouse receipt, seeing that it is properly signed and endorsed, and in looking at an ocean bill of lading to see if it is properly drawn and endorsed. Up to 1914, when the Federal Reserve Act became effective, American banks loaned money, but they did not lend their credit. The Federal Reserve system has introduced and put into operation in this country the acceptance system used by foreign banks, which is nothing more or less than a loan of credit instead of a loan of money.

Requisites of Foreign Banking

To become familiar with foreign banking it is necessary to study only a comparatively few subjects.

First of all it is necessary to learn commercial geography. That is one of the things we have neglected. A clerk who comes into the foreign department of an American bank may know that Brazil is in South America, or that Buenos Aires is in Argentina, but it is almost certain that he will not know the names of smaller towns or the way to reach them.

Commercial Geography

A knowledge of geography is absolutely essential in handling collections. I have known of clerks sending collections on Merida, Yucatan, to Mexico City. It took two days for the collection to get to Mexico City from New Orleans, and two days to get back, and then it had to be sent direct to Merida. Collections on Para, which is in the northern part of Brazil, may be frequently sent to Rio de Janeiro simply because Rio de Janeiro is the capital of Brazil. I remember one clerk sending a collection on Baranquilla, Colombia, to Medellin, Colombia. Baranquilla is about five days from New York by boat, and Medellin is away off in the interior, a two weeks' additional journey from Baranquilla.

These are only a few instances, but they illustrate details that are very important, because lack of knowledge or lack of attention to them means poor service to customers and loss of interest, as well as the possibility of ultimately being responsible for the amount of the collections so mishandled.

Knowledge of Languages Needed

Knowledge of modern languages is another essential factor in foreign banking. We have been neglecting modern languages. We are all interested today in South American countries, but very few of us know how to speak Spanish, or how to translate it. That is something we should learn to do as soon as possible. It is not necessary to know how to talk or to write Spanish like Cervantes, or, if we learn French, to write poetry like Moliere, but we should learn how to translate commercial letters, so that we may make entries in our books according to the contents of such letters.

Another requisite of successful foreign banking is a condensed knowledge of international law. We should know more about that subject, particularly about commercial law and local customs.

Dearth of Trained Men

We have enough capital, but not enough trained men. It is the lack of such men that is principally militating against our development in foreign countries. The chief reason for the slow penetration of our banks abroad is that we have so few men of experience to send abroad—men who can meet the people, men who are familiar with the language and customs of other lands, and who at the same time know our policies. There are plenty of men able thus to equip themselves, but they hesitate; they seem to think that foreign banking is very difficult, and that they are not fit for it. This attitude is a mistake. Learn the language of the country you intend to go to, and a few of the other things I have mentioned. Absorb the policy of our banks, study foreign markets and get somewhat familiar with their customs and regulations. Our representatives abroad must be educated to these essentials.

The Future

There will be enough foreign banking business for all of us, not only for New York banks but also for banks of Philadelphia, Boston, Chicago, San Francisco and other commercial centers. There will be plenty of business for all of us, and we can obtain reasonable returns without cutting rates and competing foolishly against one another. Our banks have to build new annexes abroad to help this country to keep its foreign trade, and to maintain its financial prestige in foreign countries.

The right thing to do is for them to get together, think together, and work together.

ANTICIPATING A TIMBER SHORTAGE IN ENGLAND, Mr. Thornton, the general manager and chief engineer of the Great Eastern Railway, arranged contracts for a supply of sleepers from the pine forests in the south of France, to be delivered on the quay of Bordeaux. Soon after the first ship-load was ready for transhipment to England the British Government authorities asked to have the timber transferred to them. They have been so pleased with the quality that they have asked the railway company to relinquish the whole of the contract in their favor, and this has been done, as the timber was for the armies in France.—*The Engineer.*

Co-ordination of All Transportation Facilities

Under Private Operation Competition Could Be Eliminated and a Federal System of All Transportation Be Effected

By John R. Hall,
Manager Bond Department, Hallgarten & Company.

THE precipitation of many economic questions for immediate disposition is one of the most important and bewildering results of the struggle in which the nations of the world are involved. We have for many years been so content to see problems settled by the slow methods of evolution, by discussions gradually developing public opinion, or by the action of the forces of economic necessity, that it is exceedingly difficult for us to realize that we can no longer be satisfied with a hand-to-mouth policy in anything that is vital to our interests or with seeking solutions only when difficulties take an acute form. Instead we, ourselves, must courageously take the initial steps, particularly at this time, in coping with problems which if not wholly new are bound up with conditions in many respects quite different from those existing in pre-war times.

There is a hopeful belief among some that the happy day which sees the end of the world convulsion will witness the reestablishment of general pre-war conditions, but it is doubtful whether the fulfillment of such a hope is either desirable or possible. The generations to come, freer from traditions which control contemporary thought and action, will find it easier to complete readjustments than it will be for us of the present day to launch them. But if the fact can be made plain to this generation that the old order has changed, to an extent as yet unknown, just in so far will it be possible for the nation as a whole to retain the best that we have built up as a foundation for the future.

The treatment of the railroad situation in this article, as the most important single factor in our national business life, is necessarily broad in outline without attempt at detail. There are too many questions involved to permit more than drawing outlines of various phases and conditions which must be so adjusted and rearranged that the new order may be workable, efficient and economically sound.

A Permanent Change in Organization

The government in assuming control of railroad operations has taken a step which is likely to mark the beginning of a permanent change in railroad organization and operation, as well as in the plans for development of all transportation facilities within the United States. This step is particularly significant in that it involves in effect the substitution of a unified national system for a competitive system, and, by virtue of the substitution, adopts the principle of co-operation.

The Director-General in a statement before the Senate and House committee, shortly after his appointment, said: "It was evident that under the competititve system it was impossible to get the co-ordination which was necessary to the efficient conduct of the war." Acting on this belief Mr. McAdoo is reorganizing the operations of many competing railroads along lines adapted to their operation as a single unit.

Orders are being issued which are calculated to co-ordinate the use of all transportation facilities with little or no regard to the effect they may have on the position of individual companies. If sufficient time permits him to carry out his policies Mr. McAdoo will have reformed the operations of a great many separate corporations into a unified co-ordinated system which for all practical purposes will constitute an absolute railroad monopoly.

It is the purpose of this paper to give expression to the belief that the preliminary steps taken by the government should be regarded as the groundwork of a new and permanent railroad institution. By extending and perfecting the work of the government a unified American railroad system can be created in conformity with the purposes and requirements of a progressive people who, while ridding themselves of a continuous quarrel which has been a menace to business and a reproach to our democratic polity, are determined to have a transportation system capable of serving the whole country in the most efficient manner possible.

There are numerous reasons which make it seem unwise to return to a system of competitive railroad units. Many of these have to do with weaknesses inherent in the system itself and cannot be eliminated except by abolishing it. The necessity for such an extraordinary measure will be more readily appreciated by an examination of a few of the disadvantages associated with competitive railroad operation.

The Waste of Competition

The wasteful expense of maintaining and operating a large number of separate corporations, all engaged in the same business, with complete executive, transportation, maintenance and traffic organizations, and fully equipped with tracks, terminals, cars, motive power, stations, offices, machine and repair shops and other facilities essential to the operation of each as a complete entity is inherent in the competitive system. The extravagant use of labor under such conditions is unavoidable. Capital required to finance the improvement and betterment of numerous separate railroads, which in too many cases are facilities duplicated for competitive purposes, does not produce benefits commensurate with the cost. The roads which are well equipped physically and financially attract the lost business and can be run more profitably than roads poorly equipped in these respects. Generally speaking and with due regard for exceptions, the high standards of service given the public can be kept up or bettered in the one case and the lower standards tend to remain stationary or are lowered until disaster comes in the other. Communities served by the poor roads, therefore, must suffer under the burden of unfair and unwarranted handicaps. Fast passenger and freight service, calling for the right of way and requiring the highest standards in roadbed and equipment on many lines, are wastefully duplicated between competing centers. The capacity of cars and motive power must be kept by each road largely in excess of traffic requirements. Losses due to the competitive demand for equipment, supplies and labor are inevitable. The development of vast stretches of rich territory is neglected to intensively overdevelop the facilities of districts where competition is keen.

While the foregoing items by no means cover the field, it is evident that many things which would be wasteful in a unified system must be done by competing lines as matters of self protection. In fact they are such vitally essential attributes of successful competition as to make any suggestion for their elimination untenable. Yet, to continue the

system is only to enlarge unnecessary capital costs, wastes and inefficiencies to a prohibitive degree.

Because there does not appear to be any practical way of harmonizing the conflicting interests of independently operated railroad companies composing a competitive system, and because it is so vitally important that transportation facilities be co-ordinated, the perpetuation of the system cannot be justified on the ground of economy, efficiency or public interest. In order, therefore, to obtain the benefits of a system better fitted to provide adequate facilities for handling the rapidly expanding business of the country it will be worth while to give attention to a form of organization which adopts the principle of co-operation as the base of its business structure.

Co-operation in Industry

For the past twenty-five years the principle of co-operation, alone or in combination with the control or elimination of competition, has been developed particularly in other countries to the advantage of many forms of industry. The soundness of this principle has been fully demonstrated. By recognizing it as a natural evolution of sane business practice and in establishing policies and regulatory and supervisory laws, both England and Germany have encouraged business men to expand their activities to all parts of the globe. In the United States our legislators in failing to take account of changing conditions have enacted laws which have discouraged co-operation and in general hampered business of all kinds and especially that of transportation. The war crisis has merely accelerated the coming of the time when it would be realized that the measures we have in force are, when judged by results, destructive and cannot be continued except to the detriment of the country.

The desirability of co-operation has for many years been appreciated by railroad men. They attempted to secure its full benefits by pooling and traffic agreements, mergers, control through stock ownership, and otherwise, and have only been prevented from doing so by the interposition of uneconomic laws upholding the theory of forced competition. If, in the effort to secure the maximum of efficiency and economy, railroad men had been left free to follow their own devices, they must ultimately have reached the goal towards which the government itself is now hastening. Whether or not financially profitable the procedure of the government is likely to be so farreaching in its effects as to raise an issue which will be determined on considerations involving the feasibility and desirability of unification under private or government ownership, and in no way involving a return of competitive units to their owners. If this question can be calmly dealt with there is at present good reason to believe that the principle of private ownership will be upheld in this country.

The Present Opportunity for Combination

The opportunity of combining all the railroads, through the voluntary action of the owners, has never before seemed so possible and certainly could not have been accomplished under such favorable circumstances. The most difficult and costly part of the task, that of co-ordinating facilities, has been assumed by the government, and while this is being accomplished the owners are relieved of the danger of financial disaster and are guaranteed a return that may be regarded as fair.

In view of the probability that neither the government nor the people will consent to a return to the old form of competitive operation, and of the possibility that an opportunity will be offered for the formation of a unified system under private ownership, it is fitting to take note of some of the more obvious benefits which may be expected to accrue therefrom.

A unified system of railroads physically merged and organized under a federal charter, and operated by means of a central controlling body with regional direction and supervision, would make it possible to save a great part of the heavy expense involved in maintaining hundreds of separate organizations. Rates could be made and adjusted on a broad basis of practical business considerations instead of on a competitive theory. Vexing and conflicting laws of the states and the regulations of the many public service bodies affecting rates, labor, material and operations could be largely superseded by the powers of a single federal commission.

The use of parallel tracks as double tracks; the linking up of lines not now physically connected; the pooling of the use of terminals, stations, docks, warehouses, cars, locomotives, machinery, repair shops, floating equipment and many other facilities would greatly increase capacity and efficiency, reduce operating and maintenance expense, and save the cost of all forms of new construction of a competitive nature. Standardization of types of cars and locomotives and many other supplies could be introduced and competitive purchasing stopped.

The Traffic Department

The expense of traffic departments with the exception of the tariff bureau and the industrial department could be largely eliminated; the expense of competitive advertising could be cut off; circuitous routes now enjoying differentials would discontinue such business except for overflow traffic; unnecessary duplication of competitive service in all parts of the country could be stopped, and fast passenger and freight mileage materially reduced. Cars and locomotives could be used to greater advantage, and freight and passenger mileage reduced, which would tend to increase the carrying capacity of existing facilities without additional capital outlay and at greatly lowered cost. A better use of labor could be arranged and its waste largely diminished; and the expense of unnecessary duplications of auditing, reports to commissioners, intercompany records, inspection, supervision and many other similar items could be curtailed to a considerable extent.

A studied policy could be inaugurated for national upbuilding; many miles of road into new territories could be built on the savings made by eliminating competitive construction; central electric generating stations could be built and many miles of road electrified in congested traffic districts from the same savings; a comprehensive study of labor unrest could be made by experts and their findings used to enable railroad officials to deal with the subject intelligently; a broad educational policy could be adopted by establishing a system for the careful training of men for skilled labor and executive positions, thus providing a continuous supply of capable progressive young men to solve the problems of advancing times.

Extent of the Saving

Consolidation of weak with strong roads has in the past proved beneficial to both. Unification is, in principle, a general extension of this practice to all railroads and should result in like advantages.

The elaboration in detail of the foregoing and the addition of many items not included would only serve to emphasize the fact that under the competitive system railroads are compelled to carry many heavy burdens by reason of duplicated facilities and inability to use labor and equipment in the most effective manner. Losses sustained as a result of operating under a competitive system are pure wastes which should in large part be saved by unification.

While it would be quite impossible to definitely figure the money advantages of operating the railroad lines on a unified instead of a competitive basis, it seems safe to estimate that net earnings alone could be increased in due

course by hundreds of millions of dollars per annum, and capital expenditures curtailed almost immediately.

It should not take many years to sufficiently perfect the workings of a unified co-ordinated railroad system so as to make its net earnings from operation larger than any yet produced under the competitive system. However, to secure the full advantages of such a system will take probably ten to fifteen years. All that should be hoped for from the government's efforts is an indication of the efficiency that can be attained under normal conditions when it will be possible with private control to include both economy and efficiency in measuring success. Under present conditions efficiency in moving men and materials for war purposes is necessary above all other things, for the government cannot now sacrifice anything for the sake of economy.

Not a Railroad Problem Alone

It must not be assumed, as in the past, that the problems of transportation can be cleared up by solving the railroad problem alone. The railroads, waterways, highways, port and shipping facilities are all interdependent in important respects, and it is vital that none of them be dealt with except while giving full consideration to its relation with the others.

For the last half century the United States has been fully occupied in developing its own resources and internal trade, but the time has now come when, in dealing with the transportation problem, it is of considerable consequence that full weight be given to the bearing that the overseas commerce of this and foreign nations may have on it.

England and Germany by virtue of possession, or political or financial control, enjoy special privileges in most of the best markets of the world outside of this country. To their credit it must be said that the commercial power which they have attained has been won by a thoroughness of treatment and a wise forethought, based on sound business principles and exact knowledge, which we will do well to emulate. By control of these markets, and in other respects, England and Germany have commercial advantages over us which can only be overcome under the protection and encouragement of a constructive governmental policy and by our business men making better use of available resources and originating new means for successful competition. No satisfactory results, however, can be obtained without a government policy which will address itself to the solution of the transportation problem as a whole, based on broad considerations of internal development and world wide commerce.

Other Agencies of Transportation

The railroads, aside from being permitted to form a unified system, should, with the assistance of federal, state and municipal governments, be allowed to co-operate with the steamship companies in constructing, financing and operating floating equipment, warehouses and other port facilities, in order that traffic may be efficiently handled at low cost. The advisability of giving encouragement to the extension of export and import trade by making special rates on this business should be given careful consideration. A thorough study of the waterways of the country should be made by the joint action of the federal and state authorities to determine what water courses may be widened, deepened canalized or connected to the advantage of commerce and trade. Acting on the theory that it would not be wise to attempt to extend railways into every square mile of the country, federal and state authorities by joint action could greatly advance the interests of labor, commerce and wealth by acting on a studied plan to place a complete system of well built motor highways at the service of those whose interests would be promoted by being thus brought closer to the rail and water systems. Port facilities are unorganized and are in great need of attention by the government in co-operation with those who can, from their experience, forecast the trend of foreign trade and its future requirements. Neglected ports should be built up and new ports developed to provide facilities for a more economical distribution of traffic arising from foreign trade. A careful study of the relation of a strong mercantile marine to our military and commercial needs is essential and should result in such government action as will encourage American shipowners and investors to regard this business with as much enthusiasm as accorded to it by the same classes of people in other progressive nations.

The consolidation of the railroads under a federal charter will, of course, necessitate the enactment of a complete new code of laws covering the ownership, operation and development of all rail and water transportation facilities in the United States. The purpose of the new laws being to insure for the people all of the advantages of unified railroad operation, without incurring any of the dangers of government ownership, they will have to provide for supervision and regulation by a government commission which will assist rather than hinder the development of the system. From commissions now in existence must be taken away the arbitrary power to modify rates; and, in fact, the adjustment of rate questions should be made as free from governmental interference as is consistent with the necessity of reserving to a regulatory body the power to handle effectively exceptional needs for rate adjustments.

Changes in Rates

Changes in conditions beyond the control of the managers of the roads would be sufficient cause for a change in rates; but savings effected through greater efficiency, or losses through lower efficiency, would result in benefit or detriment to the railroad stockholders. It is undoubtedly possible to make a fairly sharp distinction between items not under the entire control of the managers—which would notably include wages, cost of materials, maintenance, taxes and interest—and those which, depending upon increased or decreased efficiency, are under their control. Changes in the former would automatically cause an adjustment of rates, though in respect to certain items, such as wages and maintenance, standards should be set up below which the road could not go. As regards the latter, however, savings effected as a result of efficiency would not influence rates, but would go to swell the net income of the railroad corporation, although provision may wisely be made that there be a fair rate adjustment whenever earnings conservatively distributable to the stock of the corporation exceed a stated percentage per annum.

The savings, which will result under private operation of the roads as a unified system after they have left the hands of the government and have been relieved from giving priority to war transportation, will unquestionably be so large that it will be advisable to give the government a share in the profits of the carriers when they rise above a certain point; and it may even be wise to do the same in the case of the operatives.

Though difficult, it is undoubtedly possible to work out in detail a plan for the semi-automatic adjustment of rates, and thereby eliminate the danger of rate inflexibility. Substantial changes in wages, cost of materials, etc., effective for long periods, would cause automatically an adjustment of the rate structure, so that the payment of dividends in excess of the percentage possible under earnings obtained while the roads are under government control could only result from increased operating efficiency. With labor and stockholders sharing in the benefits accruing from operating economy the incentive for personal initiative, which is of course the main advantage of private ownership, would be maintained, while the public through the government would

get its share of the profits resulting from the unified system, in addition to having at its command a vastly superior service.

The government in dealing with the rate question should consider the wisdom of permitting the railroads to earn a surplus in excess of the amount required for dividends, to allow for the sinking fund mentioned below, and to pay for all or part of the many improvements which are wholly or partly non-productive and which might better remain uncapitalized.

The plan for the exchange of stock of the various railroads for that of the federal corporation could perhaps be chiefly based on the earnings guaranteed by the government during its control. This would probably be more than fair to security holders as the system unquestionably cannot attain the highest degree of operating economy while the transportation of war materials is paramount, and consequently the roads must incur losses during war which would be saved for the stockholders during peace.

In taking over the railroads only the stock of the individual companies need be dealt with and its acquisition would be effected by exchanging the stock of the individual roads for that of the new federal railroad corporation. Stock of this company should be issued to an amount which would permit the conservative distribution of regular dividends at a rate sufficient to attract capital under most conditions when funds are needed for development. The eleven billion dollars of mortgage bonds and other funded debt would remain outstanding and unchanged as to security, option being given to the holders to exchange them for bonds of the federal company bearing a slightly lower rate than the bonds refunded, but with redemption terms added to make the exchange desirable. A cumulative sinking fund of approximately nine million dollars per annum compounded at four per cent would discharge the present existing debt at the end of one hundred years. Were such a fund created and used first to retire the bonds of the federal company an incentive would be given to present bondholders to exchange their securities for those of the new company. All financing and refunding that could not be accomplished through the sale or exchange of stock of the federal company would be provided for by the issuance of bonds which would be the direct obligation of the federal company but secured only by a charge on its earnings.

The obstacles in the way of securing a workable and satisfactory transportation system by means of an attempt to coordinate the facilities of competitive units appear insurmountable.

The task of consolidating the railroads into a single system and of co-ordinating the operations of all the transportation facilities in the country is a great one. The easiest and most dangerous way to accomplish it is by accepting government ownership. The most difficult, but in every respect the most satisfactory way, is that which contemplates the retention of the policy of private ownership. Surely this country is not lacking in men in the government service, in business, and among labor groups who can and will rise to the occasion!

The War Finance Corporation

Inflation Can Be Prevented Only By Saving Drastic Enough to Offset the Government's Extraordinary Demands

By O. M. W. Sprague.
Edmund Cogswell Converse Professor of Banking, Harvard University

THE WAR FINANCE CORPORATION to be established under the provisions of the measure which has been passing through Congress during the month of March is designed to meet four distinct financial requirements which have become increasingly evident with each month of the war. Large resources will be at the disposal of the organization—five hundred million dollars of government funds from the treasury as capital and at least three billion dollars to be secured through the sale of notes or short term bonds.

Whether all or only a part of these resources will be needed cannot now be determined. One of the functions of the corporation will presumably involve the employment of no large amount of money. The corporation is empowered to buy and sell liberty bonds, the object in view being the stabilization of their market price through the establishment of a broader market for them. In the exercise of this function no effort should be made to establish an artificial price for the bonds. The corporation will hardly be prepared to take indefinitely large offerings since the very fact of such offerings would indicate that the yield of the bonds was insufficient and that a stable price could only be found at a lower quotation. Owing to the fact that practically everybody with funds at his disposal has purchased the bonds, comparatively small sales have at times occasioned a considerable drop in market quotations. Handled with judgment, no large amount of money should be needed to prevent extreme declines due to temporary causes, declines which are apt to prove permanent as a result of the uneasiness which they occasion in the minds of many inexperienced holders.

The second object of the measure is to conserve the available capital of the country for government use during the war by obstructing its employment for other purposes. Government war expenditure vastly exceeds the normal savings which have been available for investment during recent years. These savings are estimated at something like five billion dollars while the expenditure of the Government will apparently run between fifteen and twenty billion dollars. In these circumstances the drastic contraction of the employment of capital for other than war purposes is essential though it will not greatly lessen the absolute necessity for abnormal saving on the part of all classes of people.

The measure in its original form gave the directors of the corporation a veto power over all issues of capital in excess of one hundred thousand dollars other than those by states and municipalities. The grant of this great power was not regarded with favor by Congress. In its present form, only supervisory power has been granted, and this power has been lodged with a separate Capital Issues committee which may merely express its approval or disapproval of proposed security issues. It is to be hoped that the expression of opinion by this committee will be sufficient to prevent in large measure the use of capital for non-essential purposes. If such proves not to be the case, it will clearly be necessary to grant more drastic control over the situation.

The third object of the war finance measure is distinctly opposite in character. Patriotism stimulated by liberty loan

campaigns impels most people to devote all available funds to the purchase of government bonds. It has proved difficult, consequently, to refund maturing obligations of all classes of business corporations and to secure additional funds even by those engaged in war work. The War Finance Corporation will not tap resources which were not already available to the Government. Whatever funds it employs will by that amount reduce the funds which the Government will have at its disposal for other purposes. This is evidently true of the capital of the corporation since it is to come from the Treasury. It is no less true of the funds which the corporation will secure through the sale of its notes or bonds. Purchasers of the securities of the corporation will have less for the purchase of government bonds. The object of the arrangement is simply to provide machinery somewhat more effective than the treasury department through which both banks lending to war industries as well as those engaged directly in war work may secure needed funds.

Savings Banks

Finally the corporation is empowered to assist savings banks and building and loan associations quite regardless of whether they are employing funds in war work. These institutions are subjected to strain on account of the unfavorable effects upon them of the failure of the people up to the present time to provide from current savings the full amount of the funds which the Government is expending. The difference is made up to a moderate extent by the withdrawal from savings institutions of the savings of former years which have already been invested, and to an even greater extent by the expansion of credit on the part of the commercial banks and trust companies. The withdrawal of funds from savings banks, if one may judge from the experience of other countries, will perhaps not be sufficiently great to cause serious trouble. It is, however, desirable to make provision for a contingency of this nature. Consequently the War Finance Corporation is authorized to make advances for periods of a year to savings banks and trust companies, though at rates which properly are somewhat higher than the average rate of return on their investments.

Objection to the establishment of the War Finance Corporation has been raised on the ground that it may lead to inflation. Possibilities of inflation through the activities of the corporation are undoubtedly present, but this is not a valid objection to the measure. A condition of inflation is present whenever credit expands far more rapidly than the volume of trade. It has been going on since the beginning of the war, owing to the fact that the savings of the people are far less than the expenditures of the Government. It has, however, been a one-sided sort of inflation. We have had inflation through the commercial banks based upon commercial loans and loans on Liberty Bonds, and as a result of purchases of the bonds and government certificates of indebtedness by them. The effects of this inflation are seen in the rapid advance of prices. A moderate amount of inflation can continue almost indefinitely because the necessary slight adjustments which it involves can be made without much difficulty. Rapid inflation, on the other hand, threatens the complete disorganization of the entire industrial mechanism as was witnessed in Russia just before the revolution.

Uniformity in Expansion

How far it is possible to go on the road of inflation cannot be determined in advance, but it is clear that one-sided inflation will lead to collapse at an earlier date than somewhat more rapid inflation affecting all classes in the community. Owing to the fact that the federal reserve banks may only rediscount commercial paper and loans based on Liberty Bonds and government certificates, there has been a tendency for the banks to curtail accommodation for investment and refunding purposes. But the Government having preëmpted the supply of available investment funds and having also resorted extensively to borrowings from the banks, both business corporations and savings institutions find themselves in a difficult situation.

Alternatives

The War Finance Corporation is simply a palliative for some of the consequences resulting from inflation. It provides an arrangement by which the Government will provide directly some of the funds which in ordinary circumstances would have been secured through private channels. The Government might have used a part of the proceeds of its sales of Liberty Bonds for this purpose. It would then have been necessary to float a somewhat larger amount of such bonds than will now be necessary, bonds of the finance corporation taking their place. The Liberty Bonds would have been available at the reserve banks for loans and might have been purchased by them. The situation is not fundamentally changed by giving the bonds of the finance corporation a similar quality. The extent of inflation will be measured by the extent to which the total expenditure of the Government exceeds current savings. There is but one remedy for inflation—the desirable but painful remedy of drastic economy on the part of all citizens to an amount which will approach, if not fully cover, the requirements of the Government for funds.

Some of the results of inadequate economy and the consequent resort to the financing of the war largely by inflation are familiar. Others are not as yet very generally perceived. The burden which will fall upon persons with stationary incomes if the war is largely financed by credit expansion is well understood. The rise of prices will seriously damage such people and also of course greatly increase the money cost of the war. It is not generally recognized, however, that inflation and the consequent rise of prices may have very serious consequences upon the solvency of many corporations and impose heavy burdens upon the holders of large classes of securities.

Difficulty of Making Adjustments

During the Civil War there was a comparatively small amount of outstanding securities—bonds and preferred stocks—having a fixed rate of return. Moreover, there was then no considerable number of concerns engaged in supplying commodities or services at a fixed or customary price, as is the case now with the bulk of public service corporations, and also of a considerable number of concerns producing goods sold at a standardized price. Nearly everyone except salaried people in former times could adjust himself to rising prices by advancing the price of his own product or services. If there should be a further advance in prices of, say, 100 per cent or even 50 per cent, the effect upon all those whose investments consist mainly of bonds and preferred stocks of every variety and also of common stock of public service corporations will be most serious. It would seem that this is a consequence of inflation which, if brought home to the investment classes, and investment bankers, would induce them to set their face sternly against further inflation. An effective check, however, upon inflation cannot be found in piece-meal restrictions. The necessity for inflation can only be avoided by the adoption of measures which will induce universal economy on the part of all classes of citizens.

While the War Finance Corporation is necessary on account of the inflation which is taking place, there is a danger that by making the policy of inflation temporarily somewhat more feasible, its establishment may work against due economy. This danger can only be met by renewed efforts directed toward impressing upon the public the vital importance of a vastly greater curtailment of civilian consumption than has been generally adopted up to the present time.

Railway Age

INVESTMENT ECONOMIST SECTION

WILLIAM E. HOOPER,
Financial Editor.

There are two signed articles in this issue of the Financial Section which deal directly with the Liberty Loan. Railroad men have been liberal subscribers to the first two Liberty Loans and will undoubtedly be liberal subscribers to the third one. It is right and it is something to be proud of that it is patriotism more than anything else which has led to previous Liberty Loan subscriptions and will lead to subscriptions for the present issue of United States bonds. Nevertheless, every man owes it to himself and to his family to make an effort at least to understand something about the nature of the investment which he makes when he buys Liberty Bonds. While, in a broad way, most of the articles in the Investment Economist section deal directly or indirectly with investment, there are two articles—the one by John E. Oldham, a Boston banker, and the other by Professor Sprague of Harvard University—that every railroad man who has bought or intends to buy Liberty Bonds—and that should mean every railroad man without exception—should read with care. Professor Sprague's article deals with the War Finance Corporation, which, like the War Savings Stamps, is a device in addition to the sale of Liberty Bonds which the Government is using to raise funds and credit to finance the war; but a correct understanding of the functions of this War Finance Corporation is of the greatest value in correctly understanding the part the Liberty Loan plays in financing the war. Mr. Oldham's clear, simple, illuminating exposition of the duty which each one of us owes to his country in the way of investment in Liberty Bonds should be read equally carefully by the trainman and by the railroad president. Lack of clear thinking about the right way and the wrong way to buy Liberty Bonds is just as possible in the executive offices as it is in the cab or caboose. The point which Mr. Oldham makes that unless you purchase your Liberty Bond out of your savings and hold it without borrowing against it, you are not helping your country, but rather aiding inflation—jacking up prices against yourself and everyone else—cannot be overemphasized, it is fundamental.

Understand What the Liberty Loan Is

Secretary McAdoo has recommended, and presumably Congress will follow his recommendations, that the third Liberty Loan bear interest at 4¼ per cent and the bonds will not be convertible into any other issue of bonds made later. This is a lower rate of interest than that expected by many bankers and if it marks, as it possibly does, the limit beyond which the government interest rate will not go on bonds issued for this country, it compares with the limit fixed by the English government of 5 per cent. It is very desirable that the interest rate on Liberty Bonds should be kept as low as possible and still have them eagerly sought after both as investments and as expressions of patriotism. The higher the rate of interest fixed on Liberty Bonds, the more temptation there is for people who have money in the savings bank to draw it out to buy Liberty Bonds rather than to make fresh savings to purchase these bonds. The higher the interest rate on Liberty Bonds, the further downward will the sale of billions of these bonds drive the prices of all classes of fixed interest-bearing corporation securities, and also the prices of mortgages. Savings banks' funds are very largely invested in fixed interest-bearing securities of corporations and in mortgages. A high rate of interest, therefore, would work a double hardship: it would tend to increase the amount of deposits withdrawn and to lower the margin of safety behind deposits. The fact that Secretary McAdoo believes that the combination of patriotism and credit, which is the warp and woof of the fabric of the sale of Liberty Bonds, is 4¼ per cent as compared with England's 5 per cent shows a courage and a belief in the American people that it is now up to them to justify. It will be remembered that the first Liberty Loan, that bearing interest at 3½ per cent, is convertible into any later issue; the second Liberty Loan is convertible only into this, the third Liberty Loan. The second Liberty Loan bore interest at 4 per cent. There would appear to be an incentive, therefore, for holders of the second loan immediately to convert their bonds into the new 4¼ per cent bonds, unless, of course, there is something in the detailed enactment of the law which makes the 4 per cent bonds desirable for some specific reason as compared with the 4¼ per cent bonds. On the other hand, holders of 3½ per cent bonds may well hesitate to exchange them for the 4¼ per cent bonds. If these 3½'s are not exchanged, they carry the privilege of conversion into any later issue. If, therefore, a year from now, or two years from now, if the war unhappily lasts as long as that and conditions have changed so materially that it becomes necessary to issue a 5 per cent. bond as the British government has done, then the holders of 3½'s who have not exchanged can make the exchange into the 5's and will have lost only ¾ of 1 per cent interest for a year or two years and will gain ¾ of 1 per cent—the difference between the 4¼ and the 5 per cent that might be issued—for the full number of years which the new bonds will run.

Terms of the Liberty Loan

The government has decided to advance to the New York, New Haven & Hartford the $40,000,000 necessary to meet the short time notes which mature in April. This has been hailed as an indication that the Government intends to deal fairly with holders of railroad securities and also forecasts a fair attitude toward all investors in corporation securities. As a matter of fact, it is somewhat of a back-hand compliment to show pleased surprise that the government is going to play square. It could do nothing less than this. The banking resources and the investment resources of the country are being placed unreservedly at the disposal of the government in its efforts to finance the war. It is not a matter of surprise that the government should lend its aid in the New Haven situation—it is rather a matter of course. In England, all the financial machinery of the country was placed at the disposal of the government and the government has reciprocated by lending its help and advice wherever this was necessary to keep the machinery in good working order. Co-operation between Washington and Wall street will be a good thing for both. Washington should not accept with suspicion the whole-hearted aid which the financial interests of the whole country have tendered and, on the other hand, Wall street should not hail fair dealing on the part of the government as something to be surprised at.

A Forecast of the Government's Attitude

It is to be hoped that the article by John R. Hall on a uniform transportation system, which is published in this issue of the Investment Economist section, will draw forth extended discussion from bankers, railroad men, insurance company officers, and, above all, from federal and state legislators. There is hardly a paragraph of it that could not profitably be expanded and discussed pro and con. In one sense, Mr. Hall

A Unified System of Transportation

discusses railroad matters from an outsider's point of view, but, on the other hand, he has had a far more varied experience with railroad affairs than the average officer, even one who has risen to an executive position because his experience has been with many different roads. He has had the responsibility of passing upon the question of whether or not his house should offer securities of various railroads to their customers, and he has been actively engaged in working out the reorganization plans of roads that have recently been in the hands of receivers or are now in receivers' hands. If some of his suggestions seem impractical to men who have spent their lifetime in railroad work, let us by all means have the reason why they are impractical set forth. If there are parts of his outline which seem vague or inconclusive to congressmen or newspaper editors, or students of the transportation problem of this country, let us have a full discussion of these points. As a starter, would it be possible to administer, even under the most highly perfected form of private management, such a huge industrial activity as the operation of 260,000 miles of railroad from one central point without the evils of red tape and formalism which would be a bar to progress and individual initiative?

A Confession of Faith

IN HIS FORWORD to the Investment Economist section of the *Railway Age,* Frank A. Vanderlip says: "There is need for all the agencies we can have to spread the correct knowledge of the part which capital plays in community progress. * * * " There are not few but many very successful businesses founded upon the bedrock principle of secrecy. Nearly every banker in the larger financial centers of the country would probably hazard the opinion that the Standard Oil Company is a highly efficient commercial organization, that it is well managed to an extraordinary degree; but do any of us know anything about it? Hardly anything at all, except the amount of dividends that are paid. An investment in Standard Oil is an investment made on faith. It is in the ordinary acceptance of the term a pure gamble. Judgment based upon facts is entirely lacking.

For years the American railroads, which have formed the backbone of private investment in American corporations, have been compelled to make available to the investor and to the general public the intimate details of their financial affairs. We believe that no part of the present difficulties and low estate of the railroads is due to this enforced publicity. In fact, railroads continued to be favorably considered by investors, despite adverse regulation, amounting sometimes to confiscation, long after their dividend declarations would have warranted almost complete withdrawal on the part of investors. This was due in part probably to tradition, but in even greater part to the fact that the investor felt that at least he knew what he was getting into.

Public uilities have, on the whole, had less salutary frankness forced on them. Holding company devices are the almost universal rule. State public utility commissions have to some extent compelled accounting that is intelligible and illuminating, but the primary object of most of these commissions has been the lowering or at least the holding down of rates. Unless this also is changed, it would appear that many public utilities may have to go through some of the experiences of the railroads. Possibly it is not the proper function of the government to compel frankness in the interests of the investor. It is, however, our conception that it is the duty of the banker who recommends an investment to his customers, and that it is the duty of a paper which discusses financial subjects to demand a plain statement of conditions where possible, to give confidence to corporation offerings of securities in the measure of the frankness with which their business condition is stated.

The man who is in business only for himself, using only his own capital, has a right, except in his income tax statement, to conceal from others all the facts. But just as soon as a business has been incorporated, leaving the manager and directors without personal liability beyond the amount they have paid for stock, the concern asks the investing public to take a share in its business through the purchase of stock or to lend it money through the purchase of bonds, it should give to the public all the facts connected with the conduct of the business that can consistently be made public, without an actual—not theoretical—disclosure of valuable trade secrets. It is an incontrovertible fact that, if investors were repulsed by secrecy, not allured by it, they could very soon compel industrial corporations as well as public utilities and railroads to come out into the open. Secrecy and speculation, however, go hand in hand. It is in the interest of the investors who are not allured by secrecy, but are desirous of forming an opinion of their own on the merits of their investments, that the Investment Economist section of the *Railway Age* will be edited.

Wages Increased

THE STANDARD OIL COMPANY has announced an increase of 10 per cent in wages, making a total increase since August 1, 1915, of 62.8 per cent in general wages, and 80.57 per cent in wages of common labor, in addition to a reduction made in 1915 in hours of labor from 9 to 8, or the equivalent of a further increase in wages of 19.37 per cent. Furthermore, the Standard Oil Company has given to all employees without contribution on their part individual life insurance policies with benefits ranging from a sum equal to three months wages to $2,000. The company has also made very liberal provision for accident disability, allowing half pay for sickness of more than seven days and continuing this pay for, in some cases, six months and in other cases one year.

There are three points of view from which this subject may most profitably be discussed. Will it benefit the community as a whole? In other words, is it economically sound? Second, is it a good thing for the employees themselves individually? Third, is it a good thing for the company?

If, in the aggregate, the employees who receive these wage increases consume no more than they did in 1915 and the surplus which they are now receiving, as compared with 1915, is devoted to some productive use such as better education for their children, investment directly or indirectly in such a way as to have this surplus used productively, it will certainly do the community as a whole no harm and presumably be a benefit. There are only two ways in which the higher wages can be paid. One is by a higher price being paid for Standard Oil products by the consuming public or a less profit taken by the stockholders of the Standard Oil Company. It is getting a little into the realm of speculation to try to determine whether the surplus wealth which is now being assigned to the employees would have been consumed or saved if it represents wealth taken away from the consumers of Standard Oil products. On the other hand, it may be said with a fair degree of certainty that if this wealth assigned employees represents profits which would have been assigned to stockholders of the Standard Oil Company, it very largely is wealth that would have been used productively and not consumed had it been continued to be assigned to stockholders instead of to labor. The point that should be understood is that if this surplus of wealth assigned to employees, is consumed by them, instead of being used productively, a loss to the community as a whole will result. If wages are sufficient for the worker to gratify his normal wants for food, drink, clothing, and pleasure, an increase of wages, which is consumed entirely by larger purchases of some of these things, is an economic loss to the world.

From the point of view of the individual employee, it

would seem, at first sight, that an increase in wages was pure gain; but even here it will depend entirely on how this increase is used as to the extent of the gain to the individual. If it were to be used entirely to pay for an increased consumption of beer, for instance, it might result in an actual loss, not a gain, to the individual. Furthermore, if it is out of proportion to the worth of the individual as a worker, it, at least potentially, works harm to the individual. If the laborer gets something for nothing, by just so much is his moral fibre and his incentive to better his condition depleted.

The provision of free life insurance, without any contribution on the part of the insured, appears to be in the nature of something for nothing, which is potentially harmful. The desire to save, in order to protect one's family against want in case of the worker's death, is one of the incentives to better labor and to greater production. To do anything to lesson this incentive would seem to be economically wrong. If the employee is not asked to contribute anything toward his life insurance, something of the incentive to greater production is removed. On the other hand, had the insurance been conditioned by some contribution on the part of the employee, the incentive to greater production would have been very much strengthened. If you tell a man that if he will save one dollar, you will add five to it, you have very greatly added to his incentive to save. If the Standard Oil Company had told its employees that for every dollar each of them saved toward life insurance the company would add five dollars of life insurance, saving would have been encouraged and there would have been less of the element of danger of corruption of moral fibre lurking in the "getting of something for nothing."

From the point of view of the company, and as a business proposition purely and simply, this wage increase, reduction of hours of service, and free life and accident insurance and sick benefits, is probably an attempt to bind the employees closer to the Standard Oil Company, to offset the influence of the labor union, and to compete more strongly in the general labor market against other employers. If the object which the company has in view can be accomplished in this way, it is surely thoroughly good business.

Don't Wait Until It Is Too Late

INDIFFERENCE ON THE PART of individual investors in railroad securities has, in the past, been a source of financial loss of a magnitude hard to calculate. If railroad security holders and those indirectly, but none the less vitally, interested in railroad security values are indifferent to their own interests in the present crisis, there may be a bitterly sad awakening awaiting them when it is time to return the roads to their owners. Savings banks in nearly all the eastern states and many of the middle and western states are large holders of railroad securities. The larger life insurance companies have a very large part of their assets invested in railroad securities. Few savings bank depositors or holders of life insurance realize how utterly they are at the mercy of the government in its treatment of the railroads in the present crisis. The stockholder or bondholder or the insurance bank depositor who thinks that now that the government is to guarantee a certain fixed sum to be made available for the payment of interest and dividends on railroad bonds and stock there is no longer a need to scrutinize the earnings of his road, is laying himself open to a rude shock and a serious loss.

If rates are not so adjusted as to yield enough from the earnings of any particular road to meet the government's guarantee, the security holder of this road, if he stays ignorant of conditions till his company resumes uncontrolled and unguaranteed operation, may find himself let in for a very heavy loss. Whether the security holder is aware of the facts or not, the financial markets will have adjusted themselves to the basis of the earning power, regardless of the fact that up till the moment of returning the roads to their owners, the government has been making up a deficit from operation.

The truth is that the railroad security holder owes it to himself to watch with greater care than ever the earnings of the property in which he has his money. It is for this reason that the suggestion which was made to discontinue accounting as between different companies for the allocation of the divisions of freight and passenger rates is so full of danger. At first sight it would seem that a large amount of work in the accounting offices might be eliminated and, since the only interest of the government is to get a lump sum large enough to cover the lump sum of its guarantees, it would not be of any particular value to know which road was earning more and which less than its proper proportion. Even in the case of the government, this would be a short-sighted way to make a comparatively small saving. No system of cost accounting can properly be worked out without the allocation of revenues as well as of expenses. A knowledge of earnings is necessary to railroad executive officers for proper control of their expenses and it is just as necessary now that these officers report to the government as it ever was.

If the comparatively few people who are close to the stock market and financial news sources are the only ones to follow carefully and intelligently the earnings of individual properties under government operation, it is probable that the great majority of investors, together with savings bank depositors and holders of life insurance, will be left to get caught in the trap of their own indifference. Protest of the few wise observers of the course of events to the government would have little effect even if they were to make the protest, and generally they are not the ones who do the protesting. The security holder himself has got to watch the course of events and if the earnings of his particular road are not adequate to cover the government's guarantee, he should protest most vigorously to the government.

A detailed list of the holdings of bonds and mortgages by each individual life insurance company doing business in New York is published by the State each year; yet how many holders of life insurance ever try to check up for themselves to see what the value of the assets of their company is? Savings banks have to make an individual report in detail of their holdings of corporation securities and mortgages in Massachusetts; yet how many savings bank depositors ever look at this report which may be had for the cost of postage from the commonwealth of Massachusetts? These people, the individual investor, the savings bank depositor, and the holder of life insurance are in a position to protest now against rates or practices which are not remunerative to the particular company or companies in which they have a direct or indirect interest with an effectiveness that they little realize the power of. We believe and most students of the subject believe that it will be to the interest of the government to so adjust rates as to amply cover its guarantees to railroad security holders; but the duty and responsibility rests upon the individual investor to see that the guarantees to his particular company are being earned not in part by the surplus from some other company but by his own company.

There is another angle to this subject: If, by misfortune, government ownership should become a fact, the securities of those roads which, under government control, did not earn sufficient to cover the government's guarantee are going to fare pretty badly. It will be through no fault but that of their own if this turns out to be the case because security holders have not followed monthly and yearly earnings and have not protested against inadequate earnings.

Annual Reports

American Car & Foundry Company

A CONTINUANCE of large earnings to the American Car & Foundry Company would appear to be probable either in the event of war continuing for an indefinite period, or in the event of peace within six months. Before the war almost the entire business of the company was the manufacture of freight and passenger cars, car parts, and small industrial cars. At present a very considerable part of its business is the manufacture of munitions, trench helmets and the like for the Government. This business is proving very profitable to the American Car & Foundry Company, and in the year ended April 30, 1917, during which time the company was turning out similar work for the allies, earnings were very much greater than for any other year since the company's organization.

Earnings from all sources, after the payment for materials consumed and operating expenses, exclusive of repairs and renewals, amounted to $17,522,909. From this there was charged off $7,212,037 for renewals, replacements and repairs, and the cost (entire cost) of special equipment for the production of munitions. This left $10,313,872 available for dividends, since the American Car & Foundry Company has no outstanding bonds. The regular 7 per cent dividends on the $30,000,000 preferred stock called for $2,100,000, and in addition the company paid 6½ per cent, calling for $1,950,000 on its $30,000,000 common stock. There is appropriated as a reserve for dividends on the common $2,250,000, which, together with the $150,000 heretofore appropriated for this reserve, makes a total reserve equivalent to 8 per cent on the common. Appropriation of $2,500,000 was made for general overhauling and improvements, and of $500,000 for improving working conditions of employees, and there was $1,010,872 to be carried to surplus account.

On April 30, 1917, the company had $6,017,220 cash, $17,713,438 accounts and notes receivable, and $19,211,221 materials on hand inventoried at cost or less. Accounts payable amounted to $16,225,942.

The American Car & Foundry Company was organized in 1899. Its plant consists of 16 freight car shops, 4 passenger car shops, 11 wheel foundries, 12 gray iron foundries, 3 rolling mills and forges, 3 saw mills, 1 malleable foundry and 1 brass foundry and auxiliary shops.

In the first year or two after the organization of the company, the principal efforts of the management were directed toward the development of a flexible and compact organization. The business was concentrated in those plants where the most effective work could be done, and some of the comparatively obsolete plants were dismantled and sold. By 1909, ten years after its organization, the combined plants had a capacity of 125,000 freight cars, 1,500 passenger cars, 350,000 tons of wheels, 300,000 tons of forgings, and 300,000 tons of bar iron. During the calendar year 1917, United States and Canadian companies' orders for freight cars from the American Car & Foundry Company totaled 11,688. The United States Government orders for France totaled 4,018, and the French Government 1,850. Russia had ordered 16,500 freight cars, but the order for 10,000 of these cars was still the subject of negotiation when the Russian Government collapsed, so that there was no loss here to the American Car & Foundry Company. The order for the other 6,500 was only placed in June, and comparatively little work had been done on these cars, which were all to have been four-wheel, so that there is possibly some small loss on that order.

The total number of passenger cars ordered from the American Car & Foundry Company in the calendar year 1917 was 186.

If it is true then that the company is making large profits from war business, as its income account for the year ended April 30, 1917, would indicate, a continuation of the war would mean a piling up of large sums available for common dividends. On the other hand, there has accumulated in the past few years a very great need for both freight and passenger cars on American railroads, and this need will continue to grow at an even greater rate than heretofore. The American Car & Foundry ought also to be in a particularly good position to get a large volume of foreign orders. When peace comes, therefore, there will be an enormous latent demand for cars, car wheels and car parts. When the railroads are restored to their owners, their credit will have to be very greatly strengthened—this is a necessity—and new equipment and repairs to equipment will be one of the first uses to which new money raised by the railroads will have to be put. Peace, therefore, ought to as surely continue large profits for the American Car & Foundry as would a continuance of war.

The Western Union Telegraph

IS WESTERN UNION a peace stock as well as a war stock? That is a question about which opinion may well differ. The war has benefited the Western Union very greatly, but it is only fair to say that a large part of the profit which has come in the last two years could not have been made had not the management of the Western Union pursued a far-sighted, progressive and courageous policy for some years before the war. The volume of land line and cable service in the calendar year 1917 was 66 per cent greater than in 1914. Gross operating revenues in 1917 amounted to $76,995,511. This compares with $61,919,141 in 1916, $51,171,795 in 1915, and $46,264,777 in 1914. The unprecedented industrial activity in 1916, and the entry of the United States into the war in 1917, account for the increase in the number and length of telegrams handled by the Western Union. There have been literally thousands of messages sent each day during the past two years by telegram that under ordinary circumstances would in all likelihood have gone by mail.

When peace comes, will the people who have been telegraphing return to the use of the mails? Probably a great many of them will. Some falling off in business of the Western Union would appear probable, but there is another angle from which to look at this. There are a great many people now telephoning messages which would, under ordinary circumstances, be telegraphed. This class of message, coming back to the Western Union with the return to normal conditions, ought in part to offset the loss of the messages now being telegraphed which in peace times would be sent by mail. Furthermore, the Western Union is now doing a huge business for the Government. The rate on Government messages is only 40 per cent of the commercial tolls, and, whereas the Government paid $3,000,000 for its telegrams in 1917, if the commercial rate had been charged for these messages, they would have cost $7,500,000. The Western Union claims, apparently with a great deal of justice, that its Government business is done at an actual loss. If that is so, when peace is declared the loss from the cessation of Government business in gross earnings will be more than offset by a decrease in expenses.

In 1917 operating expenses, including repairs, rentals and taxes, amounted to $62,783,006 and, after the payment of interest on bonds and the deduction of $2,650,000 for reserves, there was $11,715,366 available for dividends. This is equal to 11.7 per cent on the outstanding stock. The regular 6 per cent dividends were paid and an extra dividend of 1 per cent was paid, calling for $6,982,298. The amount available for dividends at the end of 1916 was $12,395,405;

at the end of 1915 $10,167,592; and at the end of 1914 $5,371,395. In no one of the years prior to 1917, however, was there a deduction on account of reserves.

The Western Union is, of course, affected by labor scarcity and the high cost of materials. Over 1,200 employees have already gone into military and naval service. In 1917 there was an increase in salaries and wages of $3,380,000 and, in addition, the company made a special payment to employees receiving $2,000 a year or less, on the same basis as the special payment made in 1916. This special payment consisted of the flat sum of $25 to all messengers at independent offices, 7 per cent of the regular annual wages to employees receiving less than $1,200, and 6 per cent of regular wages to employees receiving from $1,200 to $2,000. This special payment, meant to offset the high cost of living for the small salaried employees, called for $2,170,000 in 1917, and is, of course, included in expenses.

Even before the increased business due to the European war added so much to its revenues, the Western Union was making a considerable progress in net earnings. The adoption of the night letter, the day letter and the delayed cable message, at reduced rates, all made for a fuller utilization of the plant during what would have otherwise been a slack time. It is easy to look back now and say that it was an obvious thing to do to put in the cheap night letter and the comparatively cheap day letter and delayed cable, but actually it took a good deal of courage. It was not so obvious when it was done that this service might not make serious inroads into the more expensive expedited service. Such has not, however, proved to be the case.

In 1914 the Western Union had 25,784 offices and operated 1,581,571 miles of iron wire, 676,196 miles of copper wire and 2,875 miles of land line cables. The miles of pole line totaled 199,473. There was 22,915 nautical miles of ocean cables. During 1917 the company spent net $5,218,054 on additions and betterments to plant and equipment, and included in this was $250,000 for property in Chicago on which the company is this year putting up a building which will cost approximately $1,500,000.

Current liabilities at the end of 1917 totaled $14,169,906, and this included $7,683,490 audited vouchers and accounts payable. There was $5,635,124 cash on hand, $13,561,005 accounts receivable, and $15,869,654 marketable securities.

Republic Iron & Steel Company

Whereas the Bethlehem Steel Corporation's total income was about six times as great, after allowing for federal taxes, in 1917 as in 1914, the Republic Iron & Steel Company's total income, after making provision for "excess profits, taxes, and other contingencies," was more than seven times as great in 1917 as in 1914. The increase in gross business was very much greater for Bethlehem than for Republic and, while the comparison of total profits is not an exact and, in detail, accurate comparison, it does show in a striking way how great has been the prosperity of Republic Iron & Steel under war conditions. It is an interesting and a somewhat curious fact, however, that the market price of neither the 7 per cent cumulative preferred stock of the Republic Iron & Steel or of its common stock reflects fully the change that has taken place in the income account from the beginning of 1914 to the end of 1917.

The gross volume of business in 1914 was $21,366,249. In 1917 it was $78,325,461. Total profits in 1914 amounted to $2,407,552 and in 1917, before the deduction for excess profits, to $28,769,021. The company subtracted $9,878,657 for excess profits taxes, etc., leaving total profits, after the payment of taxes, of approximately $18,460,000, or more than 7½ times the profits in 1914. Bethlehem's gross sales in 1914 were $47,500,000 and its net profits $9,649,668. In 1917 gross sales amounted to $298,929,531 and profits, after the deduction of taxes, to $53,979,360. Of course, any comparison between the value of Bethlehem stock and Republic Iron & Steel would have to take into consideration a great many other factors than those mentioned—the huge additions which Bethlehem has made to its assets, for instance; but the figures quoted are meant only to call attention to what the Republic Iron & Steel Company is doing.

After allowing approximately $2,000,000 for depreciation and renewals and $274,072 for exhaustion of minerals and allowing the previously mentioned $9,878,657 for excess profits taxes, there was $16,616,532 net profits in 1917. From this was deducted $759,335 interest on bonds, and the 7 per cent dividends on the $25,000,000 preferred stock, calling for $1,750,000, and 6 per cent dividends on the $27,191,000 common stock, calling for $1,631,460. There was left a balance of $12,475,737 to be carried to profit and loss. In 1916, a total of 18 per cent was paid on the preferred stock, so wiping out the cumulated back dividends, and 1½ per cent was paid on the common and $9,881,298 was carried to profit and loss.

The following table shows a comparison of the production in gross or net tons of the Republic Iron & Steel in 1917 and 1914:

Tons	1917	1914
Iron ore (gross)	1,706,555	1,253,105
Coke (net)	1,329,809	850,911
Limestone (gross)	106,306	28,755
Pig iron (gross)	1,062,657	777,811
Bessemer steel ingots (gross)	675,182	391,826
Open-hearth steel ingots (gross)	486,601	371,409
Total steel ingots (gross)	1,161,783	763,235
Finished and semi-finished products (net)	1,109,829	760,054

As a matter of fact, production in 1917 was restricted in the second quarter of the year by an explosion which destroyed one of the principal power stations of the company, and in the fourth quarter of the year by a shortage in fuel and in transportation facilities.

During the year $7,277,461 was spent for new constructions and additions to the property. To insure an adequate supply of fuel, new mines were bought, against which there is outstanding $1,000,000, 6 per cent first mortgage bonds. A new blast furnace was completed during the year and was blown in in September, 1917. The company now has a capacity for the production of pig iron, totaling 1,425,000 tons. The actual production in 1917 was 1,062,657 tons.

The striking thing about the growth in prosperity of the Republic Iron & Steel is the great increase in the percentage of net earnings to gross volume of business. In 1914 it was less than 10 per cent; in 1917, even after subtracting excess profits, taxes, it was over 23 per cent.

The Republic Iron & Steel, however, has had its troubles with labor as have other steel companies and industry in general. Payrolls in 1917 amounted to $17,574,481, or an average of $1,211 per man. In 1915 payrolls totaled $8,558,574, or an average of $771 per man. These figures do not include the men working in the coal mine which was purchased during 1917. Notwithstanding the much higher rate of wages paid per man, actually a less efficient class of labor is employed. If, for no other reason, lack of experience is a large factor.

The balance sheet of the Republic Iron & Steel shows the company in a very strong position as regards working capital and liquid assets. Total current liabilities amount to $13,145,000, but of this only $3,475,000 are accounts payable and the greater part of it is made up of the $8,597,086 accrued excess profits taxes and $845,365 provision for the dividends payable January 1 and February 1. Total current assets amount to $39,090,580, which includes $4,367,794 cash and $14,358,265 United States certificates of indebtedness and Liberty Bonds, and $13,475,652 inventories of manufactured products and materials and supplies at cost or less, and $908,863 ore at docks and only $5,980,005 accounts and notes receivable.

The Baldwin Locomotive Works

THROUGH the profits which have accrued to it during the last two years, the Baldwin Locomotive Works has been able to write down the book-value at which patents and good-will have been carried from $16,699,299 to the comparatively nominal amount of $899,299. In other words, with the exception of this amount the assets, as shown on the balance sheet, are a considerable value of tangible property. Real estate, machinery, and tools is carried at $27,467,201, and during the calendar year there was spent on additions to this plant $1,187,207.

The Baldwin Locomotive Works has been building locomotives since 1831. It has a manufacturing plant in the fifteenth ward of Philadelphia covering 16 acres. The company has bought or secured option on 370 acres of land at East Chicago and, furthermore, the board of directors has authorized the purchase of land adjoining the Eddystone, Pennsylvania, plant at a cost of approximately $2,500,000. The Eddystone property consists of 225 acres of land, with a plant now being used to manufacture munitions, but which can eventually be adapted to the manufacture of locomotives. The Eddystone property is leased to a subsidiary corporation, the Eddystone Munitions Company, all of the capital stock of which ($100,000) is owned by the Baldwin Locomotive Works.

In 1913 the output of locomotives was 2,025. This dropped off very sharply in 1914 to 1,804. In 1915 it was 1,869, and in 1916, 1,989. In 1917 the entire plant was being worked nearly to capacity. There were 2,748 locomotives built, and, in additon, $13,835,707 of other regular work was completed. In additon, contracts for shells and other special work amounting to $20,972,584 were completed. Thus the gross sales in the calendar year 1917 amounted to $98,263,865. This compares with $59,219,058 in 1916, $22,083,011 in 1915, $13,616,163 in 1914, and $37,630,969 in 1913.

The manufacturing profit in 1917 was $11,779,020, in 1916 $6,361,811, in 1915 $2,725,573, in 1914 $320,609, and in 1913 $3,886,475.

The percentage of manufacturing profit to gross sales compares as follows:

1917	12.0
1916	10.7
1915	12.3
1914	2.4
1913	10.3

The Baldwin Locomotive Works has outstanding $9,400,000 first mortgage bonds and $20,000,000 preferred stock and $20,000,000 common stock. Regular dividends of seven per cent on the preferred stock (on which dividends are cumulative) have been paid since the incorporation of the present company in 1911. From 1912 to 1914, inclusive, two per cent dividends annually were paid on the common stock; but since 1914 no common stock dividends have been declared.

The common stock is now selling at 77 and the preferred in the neighborhood of 100. The first mortgage bonds are selling at about 100. In February and March of 1914, before the declaration of war and after the prosperous year of 1913, Baldwin common was selling at 50, Baldwin preferred at 108, and the five per cent first mortgage bonds at 104.

The balance sheet of December 31, 1913, showed plant and equipment, which we now know included $16,699,299 patents and good-will, carried at $37,081,026, current assets at $15,735,635, which included $4,563,848 cash and $3,155,175 inventories. There were only $449,442 accounts payable. At the end of 1917, plant and machinery, excluding any good-will and patents, was carried at $28,254,408 and current assets at $38,811,325. This included $6,757,339 cash and $20,434,766 inventories. Accounts payable amounted to $5,768,698, and bills payable to $8,250,000.

The market now puts a value of $15,400,000 on the $20,000,000 Baldwin Locomotive common, on which in 1914 it put a value of $10,000,000. If we should subtract from the assets the $30,000,000 par value of preferred stock and first mortgage bonds and subtract also the patents and good-will, the amount of current liabilities, debt to the Government and interest accrued on bonds, we get $22,361,048, the net assets allocatable to the common stock in 1917, and $8,188,492 in 1913.

Cities Service Company

THE CITIES SERVICE COMPANY is a holding company for companies doing a considerable variety of public utility and other businesses and the plants of these public utilities are scattered broadly over the country. For instance, one of the subsidiary companies is the Denver Gas & Electric Light Company of Denver, Colo., one the Empire District Electric Company of Joplin, Mo., the Danbury & Bethel Gas & Electric Light Company and the Empire Gas & Fuel Company,

Central News Photo Service

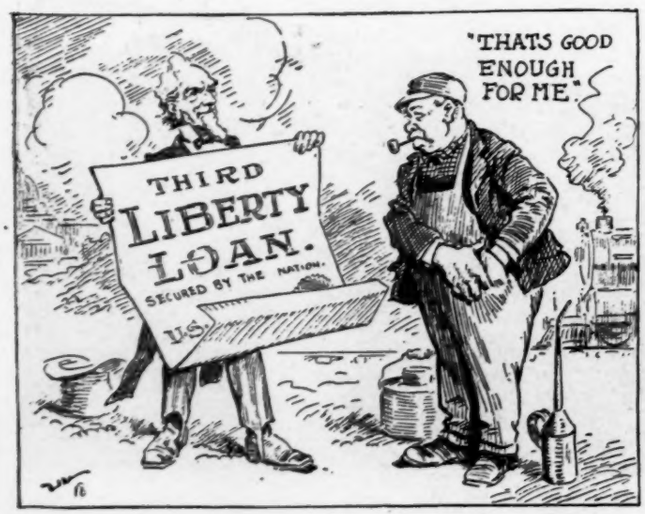
The King of the Belgians Inspects a Belgian Heavy Battery

with a large number of subsidiary oil companies. While, of course, the public utilities part of the business has had to face the great increase in cost of labor and materials, without in most cases, any opportunity to raise rates, the astonishing increase in oil production has, together with a great increase in fuel consumption, because of industrial activities, added very greatly to the gross income of the Cities Service Company.

Gross earnings in the calendar year 1917 totaled $19,252,492, comparing with gross earnings of $10,110,343 in 1916. This is an increase of over 90 per cent. Earnings available for dividends on the common stock amounted to $60.73 a share. Only $6 in cash and $6 in stock was paid out in dividends. It is a rather remarkable fact that although the company has expanded its operations on a very large scale and at a very rapid rate, the bonds outstanding against the subsidiary companies are equal to only $1.42 for each one dollar of annual subsidiary gross earnings.

The combined capital assets of the subsidiary companies are carried at $345,247,763. The Cities Service Company itself has outstanding in the hands of the public $25,666,300 common stock and $66,494,800 preferred stock, and of the subsidiary companies there is $3,685,869 common stock outstanding in the hands of the public and $5,975,144 preferred stock outstanding in the hands of the public. The Cities Service Company itself on January 10, 1918, had on hand $2,191,552 cash, with only a nominal amount of current liabilities. The balance sheet for the combined subsidiary companies is for December 31, 1917, and on that date the subsidiaries had $1,621,964 cash in local banks and $1,501,314 cash in out-of-town depositories. There were $4,524,867 current accounts payable, $19,544,818 bills payable and $4,580,171 taxes accrued. The total current liabilities of the subsidiary ocmpanies including the items just mentioned, amounted to $32,916,097. The total current assets of the subsidiaries, including the cash previously mentioned, was $36,602,334, of which the two largest items were crude and refined oil stock $11,013,489, and stores and supplies $8,228,545.

The combined statement of earnings of the Cities Service Company and its subsidiaries is especially interesting. In 1914, gross earnings amounted to $19,093,653, expenses to $11,577,582, and interest charges to $3,069,327, leaving $4,446,744 available for dividends. By 1916 gross earnings had increased to $48,052,573, operating expenses to $28,908,646, interest charges to $5,076,074, and the amount available for dividends to $14,067,853. In 1917 the combined gross earnings were $69,634,872, operating expenses $44,180,841, interest charges $5,976,506, leaving $19,477,526 available for dividends.



The United States Steel Corporation

NO ATTEMPT will be made here to comment on the showing made by the United States Steel Corporation in the calendar year 1917.

The following table gives the income account for the years ended December 31, 1917 and 1916:

	1917	1916	+Increase —Decrease
EARNINGS—Before charging interest on bonds and mortgages of subsidiary companies:			
First quarter	$78,994,371.04	$63,110,720.27	+ $15,883,650.77
Second quarter	90,592,701.88	83,501,065.24	+ 7,091,636.64
Third quarter	73,007,297.57	88,159,733.30	— 15,152,435.73
Fourth quarter	61,567,101.04	108,225,573.63	— 46,658,472.59
Total for year	*$304,161,471.53	$342,997,092.44	— $38,835,620.91
Less, interest on outstanding bonds and mortgages of the subsidiary companies	8,869,291.50	9,422,914.94	— 553,623.44
Balance of earnings	$295,292,180.03	$333,574,177.50	— $38,281,997.47
Less, charges and allowances for depreciation applied as follows, viz.:			
To depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies	43,296,038.26	32,762,072.38	+ 10,533,965.88
To sinking funds on U. S. Steel Corporation bonds	7,257,233.41	6,785,540.27	+ 471,693.14
Net income in the year	$244,738,908.36	$294,026,564.85	— $49,287,656.49
Deduct:			
Interest on U. S. Steel Corporation bonds outstanding	21,256,303.17	21,602,852.90	— 346,549.73
Premium paid on bonds redeemed:			
On subsidiary companies' bonds	117,914.50	146,277.11	— 28,362.61
On U. S. Steel Corporation bonds	745,933.69	870,673.57	— 124,739.88
Balance	$222,618,757.00	$271,406,761.27	— $48,788.004.27
Add: Net balance of sundry charges and credits, including adjustments of various accounts	1,600,807.54	124,969.11	+ 1,475,838.43
Balance	$224,219,564.54	$271,531,730.38	— $47,312,165.84
Dividends on U. S. Steel Corporation stocks:			
Preferred, 7 per cent	25,219,677.00	25,219,677.00	.....
Common: 1917, regular 5 per cent, extra 13 per cent; 1916, regular 5 per cent, extra 3¼ per cent	91,494,450.00	44,476,468.75	+ 47,017,981.25
Net income	$107,505,437.54	$201,835.584.63	— $94,330,147.09
Less, Appropriated from net income on account of expenditures made and to be made on authorized appropriations for additional property, new plants and construction	55,000,000.00	.....	+ 55,000,000.00
Balance carried tc undivided surplus	$52,505,437.54	$201,835.584.63	—$149,330,147.09

*Balance of earnings after making allowances for estimated amount of Federal income and war excess profits taxes.

Chairman E. H. Gary in his annual report says in part:

The large demand for iron and steel products which existed during 1916 continued during the year 1917. This was increased after the entrance of the United States into the European war, especially for certain lines of products required for the war program. These demands largely exceeded the producing capacity of the manufacturers and, because of the largely increased cost of labor, raw material and supplies, the prices for steel products advanced materially.

Two general advances in wage rates of employees of 10 per cent were made on May 1 and October 1, respectively. These followed three increases in 1916, each of substantially the same percentages and resulted in making the wage rates in effect at close of the year 65 per cent above the rates prevailing at the close of 1915 in the case of unskilled labor and an average of 58 per cent higher in respect of all employees. In December, 1917, the average earnings per em-

ployee per day of all the employees, exclusive of the administrative and selling force, was $4.60; and of the total, including the administrative and selling staff, $4.65.

The smallest number of employees in the service of the corporation and its subsidiary companies during the year in any month was 250,836, and the highest number 277,526. The average number employed during the entire year and the total payroll in comparison with results for 1916 were as follows:

	1917	1916	Increase	Per cent
Average number of employees during the entire year	268,058	252,668	15,390	6.1
Total amount of payrolls	$347,370,400	$263,385,502	$83,984,898	31.9

During the year 11,486 employees of the United States Steel Corporation and its subsidiary companies entered the regular war service of the United States.

At December 31, 1917, the tonnage of unfilled orders of the subsidiary companies was 9,381,718 tons of rolled steel products, a decrease in comparison with December 31, 1916, of 2,165,568 tons. The conditions prevailing in respect of governmental regulation of prices, priority orders on production and the demands for war purposes directly and indirectly of a large percentage of the output of the mills, naturally interferes with forward buying by customers.

The output of the properties and plants of the subsidiary companies in 1917 did not quite reach the record figures of the previous year, notwithstanding additions and extensions completed and placed in operation increased somewhat the capacity. The decrease in production and output in 1917, compared with 1916, is attributable principally to inability to secure sufficient employees to fully man the plants and to the lack of ample transportation service to furnish the plants with necessary raw materials and supplies. The production during the year, in comparison with results in 1916, of basic raw materials and of semi-finished and of rolled and other finished products for sale to customers was as follows:

	1917 Tons	1916 Tons	Increase or decrease Tons	Per cent
Iron ore mined	31,781,769	33,355,169	1,573,400	— 4.7
Coal Mined:				
For use in making coke	24,554,525	26,606,041	2,051,516	— 7.7
For steam, gas and other purposes	6,942,298	6,162,340	779,958	+12.7
	31,496,823	32,768,381	1,271,558	— 3.9
Coke manufactured	17,461,675	18,901,962	1,440,287	— 7.6
Limestone quarried	6,494,917	7,023,474	528,557	— 7.5
Pig iron, ferro and spiegel	15,652,928	17,607,637	1,954,709	—11.1
Steel ingots (bessemer and open hearth)	20,285,061	20,910,589	625,528	— 3.0
Rolled and other finished steel products for sale	14,942,911 Bbls	15,460,792 Bbls.	517,881 Bbls.	— 3.3
Universal Portland cement	10,917,000	10,425,600	491,400	+ 4.7

The shipments of all classes of products to customers during 1917, in comparison with the shipments during the preceding year, were as follows:

	1917, Tons	1916, Tons	Increase or Decrease Tons	Per Cent
Domestic Shipments				
Rolled steel and other finished products	13,196,910	13,075,295	121,615	+ .9
Pig iron, ingots, spiegel, ferro and scrap	534,768	524,885	9,883	+ 1.9
Iron ore, coal and coke	999,590	1,172,958	173,368	—14.8
Sundry materials and by-products	139,998	160,483	20,485	—12.8
Total tons all kinds of materials, except cement	14,871,266	14,933,621	62,355	— .4
Universal Portland cement (bbls.)	10,398,759	10,861,426	462,667	— 4.3
Export Shipments				
Rolled steel and other finished products	2,173,195	2,466,793	293,598	—11.9
Pig iron, ingots and scrap	19,479	32,636	13,157	—40.3
Sundry materials and by-products	1,911	2,198	287	—13.1
Total tons all kinds of materials	2,194,585	2,501,627	307,042	—12.3
Aggregate tonnage of rolled steel and other finished products shipped to both domestic and export trade	15,370,105	15,542,088	171,983	— 1.1

Total value of business (covering all of above tonnage):	1917	1916	Increase	Per Cent
Domestic	$1,026,393,678	$702,801,167	$323,592,511	46.0
Export	179,488,730	150,463,290	29,025,440	19.3
Total	$1,205,882,408	$853,264,457	$352,617,951	41.3

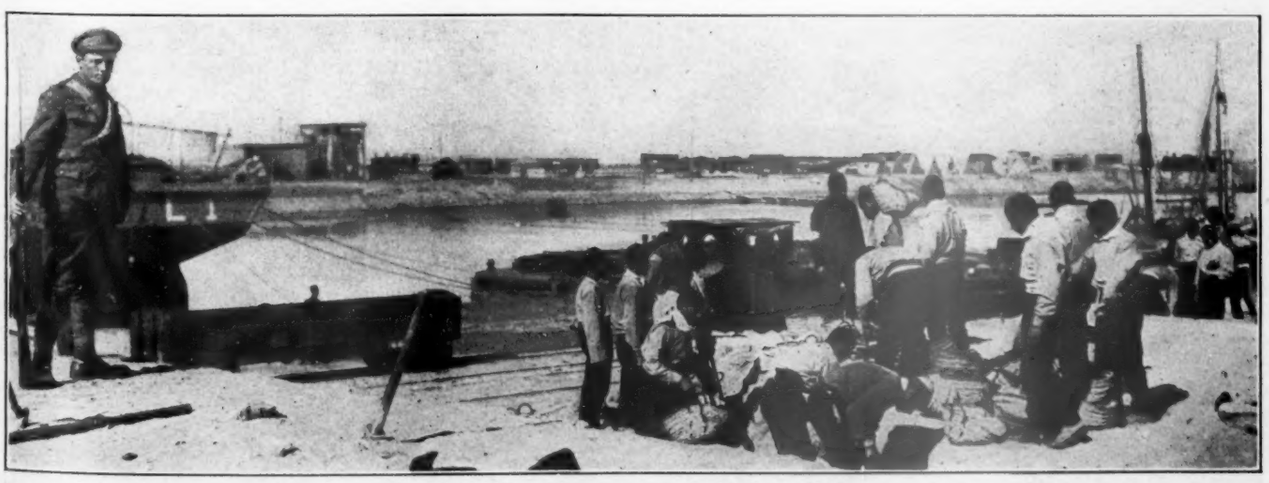
The expenditures made during the year for repairs, maintenance and general up-keep of the properties in comparison with outlays for similar purposes during the preceding year were as follows:

	1917	1916	Increase	Per Cent
Ordinary repairs and maintenance	$84,666,857	$63,313,553	$21,353,304	33.7
Extraordinary replacements and general rehabilitation	7,957,472	6,079,074	1,878,398	30.9
Total	$92,624,329	$69,392,627	$23,231,702	33.5

The large increase over previous year in the expenditures for current and ordinary maintenance is accounted for to a considerable extent by greater cost of labor and material.

The total of all charges to and allowances from gross earnings for the year to cover exhaustion of minerals and deterioration arising from wear and tear of improvements amounted to $136,057,605, an increase of $31,481,226, or 30.1 per cent, in comparison with similar charges and allowances in 1916.

The total charges to income account for the year for taxes levied against the Corporation and its subsidiary compa-



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Turkish Prisoners Loading Barges in Egypt

nies, *exclusive* of Federal income and excess profits taxes, amounted to $18,800,260, in comparison with $16,907,712 for 1916. Charges were made against 1917 earnings for an estimated allowance of $233,465,435 for account of Federal income, war income and excess profits taxes for the year. The exact amount of these taxes which may be due and payable cannot be fully determined at the date of writing this report, and it is possible that upon final compilation of tax returns, based on the latest Treasury interpretations of the law, subsequent adjustments may be necessary. It is believed the charges stated will be sufficient to cover the final figures.

During the year there were purchased or constructed by the subsidiary manufacturing, coal and railroad companies additional railroad equipment for general transportation service, as follows: 31 locomotives, 4,280 steel freight cars, 324 box and dump cars, and 28 road cars of various kinds, costing in all $10,002,070. Three 12,700-ton capacity ore carrying vessels were purchased and placed in commission during the year. One additional steamer of same type was ordered for delivery in 1918.

At the date of writing this report the total amount unexpended on authorized appropriations for new plants, extensions and additions and betterments, including iron ore mine stripping operations for 1918, equaled approximately $187,000,000. It is estimated that about $110,000,000 of this total will be expended in 1918.

In January, 1918, there was offered to the employees of the United States Steel Corporation and of the subsidiary companies the privilege of subscribing for shares of Common Stock of the Corporation, at the price of $92 per share. Subscriptions were received from 43,258 employees for an aggregate of 95,437 shares. These subscriptions represent an increase of 10.7 per cent in respect of number of subscribers, and 41.5 per cent in the number of shares subscribed over the previous year. The conditions attached to the offer and subscription, aside from the feature of price, were generally similar to those under which stock has been heretofore offered to employees. The usual distribution of special compensation to employees on the basis of the plan adopted in 1903 was also made.

The Trustees of the United States Steel and Carnegie Pension Fund disbursed during the year 1917, in pensions to retired employees, the sum of $712,506.65. Pensions were granted during 1917 to 241 retiring employees.

The total amount expended by the Corporation and the subsidiary companies during the year for safety work was $998,806, in comparison with $848,080 in the previous year. Compared with results in 1916, the fatal and serious accidents per 100 employees showed a decrease of 14.67 per cent, and, compared with 1906, a decrease of 41.63 per cent. The reduction in the relative number of accidents in 1917, compared with previous year, is notable in view of the increased force employed during 1917, which included many new employees not familiar with safety rules and regulations.

The total amount disbursed by all the companies during 1917 in connection with work accidents was $3,171,994. Of this sum 87 per cent was paid directly to the injured employees or their families or in taking care of them. These payments were made either in accordance with the provisions of the Workmen's Compensation Laws enacted by the several states in which the subsidiary companies are operating, or under the Corporation's Voluntary Accident Relief Plan where there is no statutory law applicable.

In furtherance of the established policy of providing modern sanitary facilities for the health and comfort of the employees, much additional equipment was installed throughout the plants and mines during the year. This added equipment included drinking water systems and sanitary drinking fountains, closets, wash and locker rooms, including 496 shower baths and 15,763 lockers.

The efforts of the Corporation and its subsidiary companies toward the improvement of the material welfare of the employees and their families referred to in previous annual reports have been systematically continued. Due to the increased labor forces and the scarcity of dwellings, it has been necessary for the subsidiary companies to build a large number of houses to accommodate the workmen. Much thought and study has been given to the design and plans of these houses, with a view to furnishing the workmen homes with modern conveniences and at a moderate rental. Through the aid of the subsidiary companies, employees were enabled to increase largely the number of vegetable gardens planted by them during the past year. Considerable unoccupied land adjoining the plants was laid out in plots, which employees were permitted to use for raising vegetables. Altogether, the area utilized by employees for this purpose equaled 2,082 acres and comprised 15,705 gardens.

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British Troops Build Light Railways As They Advance

The Small Investor

IT will be the object of the Investment Economist section of the Railway Age to avoid columns of statistics. The quotation, therefore, of stock and bond prices will not be included; but every subscriber to the Railway Age has the privilege of writing in to the Small Investor and asking for price quotations on either listed or unlisted securities. The Railway Age will undertake to furnish an approximate quotation of all securities listed on the New York Stock Exchange as of the day of the receipt of the inquiry and will do its best to furnish a bid and asked price for unlisted securities with such information as is available from reliable sources.

We will be glad to answer inquiries, which we will treat as confidential, about investment securities and while, of course, such quotations of prices and answers to inquiries cannot be guaranteed, they will be obtained in all cases from sources which we believe to be reliable and impartial.

What is an Investment?

PUTTING a penny into a little iron bank from which it cannot be extracted is not an investment, but it contains one of the elements necessary to making an investment and the psychology of it is worth examining. Why is it that the iron bank should play so important a part in making it easier to save? It is just as much a saving if the penny is kept in the small boy's trousers pocket as it is if it is put into the iron bank. For one thing, however, the boy has to save the same penny over and over again if he carries it in his pocket. Every time he passes a candy store he has to perform an act of self-denial. On the other hand, when he puts the penny into the bank, he makes one act only of self-denial.

The Century Dictionary defines invest as "to employ for some profitable use; convert into some other form of wealth . . . ." The distinction between saving and investment is the difference between unemployment and employment of money but still the psychology of the boy's penny bank enters into investment. When you save and make an investment, your saving or act of self-denial is completed. You do not have to save the same money every time that you wish to go to the theatre or to indulge in any pleasure that costs money.

It is, of course, this perfectly well recognized trait of human nature that makes it easier to sell almost anything on the instalment plan; but in investment the saving is made with the expectation of profit either through wages which someone else is willing to pay you for the use of your money or enhancement of the value of the other form of wealth, in which you have invested your money, measured in terms of money.

There is a great variety of ways in which the man or woman who will save can make an investment. Money put in the savings bank is in the final analysis money which is intrusted to someone else to invest. It is only in degree that it differs from direct investment in mortgages or bonds on the advice of someone in whom you have confidence. When you put $50 in a savings bank, however, you are indirectly making a diversified investment. The deposits of the savings bank are used to buy many different kinds of corporation securities and to loan on real estate in different communities, so that, if the savings bank management has used bad judgment in a single instance or a few scattered instances, the impairment of the value back of your $50 is so slight as to be negligible. To put money in a savings bank, therefore, is one of the safest ways of making an investment. Since, however, the risk of loss is one of the elements which enters into the price which you can get in the form of interest for the use of your money, the interest paid by the savings bank is comparatively low.

Let us assume that you can make a regular investment of $50 every two months. Is it possible to invest this money directly in securities of corporations and in time get a diversified investment based on your own judgment? If you are willing to put a certain amount of thought and study into it, it is possible. In this department of the Financial Quarterly of the *Railway Age,* there will be discussed in the simplest terms and in considerable detail the general principles which can be applied to forming a judgment of the worth of an investment in corporation securities. In this first article, the barest outline only of these principles will be given.

The first question is as to what constitutes security for an investment. The distinction between stock and bond is the distinction between a partnership in a business and being a creditor of the business. If you buy stock of any corporation, you are buying a right to share in the profits of that business and are intrusting your money to the management of the business with the knowledge that this money will be used to meet losses if there are losses. If you buy bonds, you lend your money to the business and as long as the business can pay its debts, you will receive a certain fixed amount every three months or every six months as wages for the use of your money.

Broadly and roughly, the large corporations in which you might consider making an investment, that is, buying their stock or their bonds, may be divided between (1) railroads, (2) public utilities and (3) industrials.

Whether you invest in the stock or in the bonds of a railroad company, the only real security for your investment lies in the net earning power of the railroad. Even if the investment is in first mortgage bonds where, if the railroad should default in interest, the bondholders could step in and take the road, wiping out the interest of stockholders to the full extent necessary to get the par value of their bonds, it still remains true that net earning power is about all the security that the bondholder has. If operating the railroad as a railroad will not earn net enough to pay the interest on the first mortgage bonds, the right to sell the road is of almost negligible value where the amount of bonds per mile of road is nothing more than the merest fraction of the cost of building such a road.

Under the heading public utility, come street railway companies, gas and electric companies and the like. Security in this case rests on the type of franchise which the company has, the potential and actual consumer demand for its services and the freedom which it enjoys from competition. There is also, of course, the question of the fairness with which the company is likely to be treated by the authorities which have the power of regulating it. If a gas company has a perpetual franchise, exclusive right to lay gas mains in a growing and prosperous town, and is subject to jurisdiction of a public utility commission which has a record for fair dealing, the security of its bonds or stock is, other things being equal, comparatively high. With the public utility as with the railroad it is primarily net earning power which forms the security for the bondholders as well as the stockholders.

Industrials, so called, are the companies which do a manufacturing or selling business as, for instance, the Republic Iron & Steel Company, the American Woolen Company, or Sears Roebuck & Co. With these companies, the first question of security of investment must be answered from a study of the assets and liabilities of the company. Has the company sufficient cash to give it ample working capital? What is the value of its liquid assets? By liquid assets is meant

things which can be sold comparatively readily and the sale of which would not mean the discontinuance of the business; for instance, stocks of raw material and all manufactured articles on hand would be liquid assets of a manufacturing company in contra-distinction to its manufacturing plant, which latter, while it might be saleable and usable for other manufacturing purposes, is indispensable for carrying on the business. The next question is as to the conservation of the valuation of assets. Is a fictitious value placed on good will and patents, and by fictitious in this case is meant too high a value? If good will and patent are carried at a nominal sum, $1 or $100, it is true that this may be a fiction but it is a fiction in the interests of conservatism.

The industrial, unlike the public utility with an exclusive franchise, is always subject to competition. The protection against competition must lie in an organization and plant which permit of a low manufacturing cost.

This outline is not intended to be anything more than indicative of the method of approach of an investigation as to the value of an investment.

Relation Between the Stock Market and Investment

The Difference Between Speculation and Investment Is Fundamentally a Difference in the Mental Attitude

IT IS SOMETIMES SAID that all Americans who buy corporation securities are at heart speculators, not investors. This is not strictly true, but it is true that very often the American investor confuses speculation and investment in a way in which the French investor does not. The French investor, and to a great extent also the English investor, thoroughly understands that what he wants to do is to purchase a fixed income and that his primary concern is to make certain that this income will be surely and regularly paid him. The American investor, and this is equally true of women who are in circumstances which should lead them to adopt the French view without reservation, confuses the market price at which from time to time their investment securities are quoted with the value and security to them of the income which they have purchased.

An open security market is of value to investors as well as speculators but, whereas the speculator makes his profit from the fluctuations in the price at which securities are bought and sold in this market, the investor uses the market as a place in which to buy the securities which yield the income which he desires, or to sell these securities if necessity arises.

In the ordinary use of the term investment, is meant, either a purchase of securities with the sole object of receiving an income from the interest thereon or the dividends thereon, or a purchase with the expectation of enhancement in market value. For the purposes of this discussion, however, when investment is spoken of, only the simon pure variety—purchase of income—is meant. The investor, therefore, in this sense, is interested in the fluctuations in market price only as they offer a more or less propitious time to make a purchase of securities. After deciding that a particular time appears to be propitious to buy a certain security, the investor may well forget entirely the daily quoted price of his security. What he should continue to watch is the earnings of the corporation whose security he has bought.

The speculator is concerned with a number of elements of varying importance, and by speculator is meant the purchaser of corporation securities who is not concerned solely with the income which they yield him but is also desirous of making a profit through the sale of his securities at a higher price than he paid for them. The two principal factors which he must study are the general trend of all security prices—the general trend of the market as it is called. The other factor is the relative trend of the price of the particular security which he is considering buying as compared with the general trend of prices.

The trend of the general market for so-called standard railroad stocks has been slightly upward since the beginning of 1918 and of the industrial stocks, most dealt in on the New York Stock Exchange, upward. On the other hand, the trend of prices of railroad bonds has been slightly downward, of industrial bonds, slightly upward, and of public utility bonds downward during January and nearly stationary in February and March. Both bonds and stocks have been lower in price in the first three months of 1918 than they were in either 1917 or 1916, and bond prices have been lower than they were in 1915. It would appear, therefore, that the present is a propitious time for the investor who desires to buy income to make an investment, regardless of the fact, which he must recognize, that if the war continues for a considerable period, the market price at which the securities he may buy will be quoted may and probably will be lower than the price which he pays for them now.

To the speculator who is looking for an enhancement in value reflected in a higher quoted price, this possibility cannot be disregarded. Prices are low now but it is quite conceivable that they may go lower still. For speculative purposes, the industrial stocks would appear to be in a much more favorable position in general than railroad stocks. There are many industrial companies which are making large profits out of the manufacture of articles required for the conduct of the war and some of these companies will be in a position to continue to make large profits out of the deferred need for their products in times of peace. With the railroad stocks, however, the outlook is not at present encouraging.

While Director General McAdoo denies any desire to have the Government retain the railroads after the elapse of twenty months after the declaration of peace, it is not at all unthinkable that the Democratic party would go to the country in 1920 with one of the planks in its platform advocating a retention of the railroads, either by a continuation of control and operation or the further step of outright government ownership of the railroads. If government ownership were to be the issue and the country should have the misfortune to adopt it, owners of railroad securities would be, it appears now, in an unenviable position.

While the courts follow public opinion more slowly and conservatively than Congress, after all public opinion is the ground work on which court decisions are founded, even though the legal justification of these decisions is based on previous legal decisions. If the country should vote for government ownership, there is an imminent danger of a huge confiscation of equities of the holders of railroad securities, the courts notwithstanding.